Report of the Ministry of Forests

Fiscal Year Ended March 31, 1984

Province of British Columbia
Ministry of Forests

Honourable T. M. Waterland, Minister

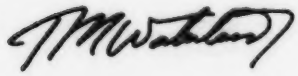
October 1, 1984

The Honourable Robert G. Rogers,
Lieutenant-Governor of British Columbia

May It Please Your Honour:

Herewith I respectfully submit the Annual Report of the Ministry of Forests for the year ended March 31, 1984.

Yours truly,



T.M. Waterland,
Minister

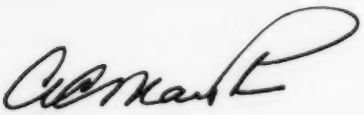
September 28, 1984

The Honourable T.M. Waterland,
Minister of Forests,
Parliament Buildings,
Victoria, B. C.

Sir:

I have the honour to submit the Annual Report of the Ministry of Forests for the year ended March 31, 1984.

Yours truly,



R.W. Robbins,
Acting Deputy Minister

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I. Directory

(March 31, 1984)

Victoria

Minister
HON. T.M. WATERLAND

Executive Committee
T.M. APSEY,
Deputy Minister and Chairman, Executive Committee
R.J. CULLEN,
Assistant Deputy Minister, Finance and Administration Division
W. YOUNG,
Chief Forester and Assistant Deputy Minister, Forestry Division
R.W. ROBBINS,
Assistant Deputy Minister, Operations Division
A.C. MacPHERSON,
Assistant Deputy Minister, Timber, Range and Recreation Division

Executive Director
J.A.K. REID,
Legislation and Policy

Special Advisor to the Deputy Minister
J.A. BIICKERT

Branch Directors
C.P. WILLIAMS,
Director, Engineering Branch
R.K. NATSUHARA,
Ministry Comptroller, Financial Services Branch
J.R. COX,
Director, Information Services Branch
F. HEGYI,
Director, Inventory Branch
J.F. SHEPPARD,
Director, Legal and Administrative Services Branch
W.R. WHITE,
Acting Director, Personnel Services Branch
C.J. HIGHSTED,
Director, Planning Branch
H.G. DOERKSEN,
Director, Protection Branch
W.N. McLACHLAN,
Director, Range Management Branch
H.N. MARSHALL,
Director, Recreation Management Branch
J.A. DANGERFIELD,
Director, Research Branch
C.M. JOHNSON,
Director, Silviculture Branch
VACANT,
Director, Strategic Studies Branch
J.G. HILL,
Director, Systems Services Branch
L.G. UNDERWOOD,
Director, Technical Services Branch
J.J. JUHASZ,
Director, Timber Management Branch
H. WAELTI,
Director, Valuation Branch

Forest Regions and Districts

Cariboo Forest Region

Regional Manager
J.A.D. McDONALD,
Williams Lake

District Managers
R. REEVES,
Chilcotin Forest District, Alexis Creek
J. MENNING,
Horsefly Forest District, Horsefly
R.T. OSTBY,
100 Mile House Forest District, 100 Mile House
W.V. BOUDREAU*,
Quesnel Forest District, Quesnel
W.S. CARR,
Williams Lake Forest District, Williams Lake

Kamloops Forest Region

Regional Manager
A.B. ROBINSON,
Kamloops

District Managers
M.E. MONTEITH,
Clearwater Forest District, Clearwater
W.R. ANDERSON*,
Kamloops Forest District, Kamloops
M.T. LINDBERG*,
Lillooet Forest District, Lillooet
J.E. LeDUC,
Merritt Forest District, Merritt
S.E. HANSEN*,
Penticton Forest District, Penticton

J.H. LITTLE,
Salmon Arm Forest District, Salmon Arm
E.W. HEWITT,
Vernon Forest District, Vernon

Nelson Forest Region

Regional Manager

J.R.D. CUTHBERT,
Nelson

District Managers

VACANT,
Arrow Forest District, Castlegar
G.H. NICHOLS*,
Boundary Forest District, Grand Forks
R.R. TOZER,
Cranbrook Forest District, Cranbrook
D.E. GILL,
Golden Forest District, Golden
D.F. HENDREN*,
Invermere Forest District, Invermere
J.P. SEDLACK,
Kootenay Lake Forest District, Nelson
T. HARVIE,
Revelstoke Forest District, Revelstoke

Prince George Forest Region

Regional Manager

M.J. WILKINS,
Prince George

District Managers

T.R. GIBBS,
Dawson Creek Forest District, Dawson Creek
A.C. JOYCE,
Fort Nelson Forest District, Fort Nelson
W.E. HALL,
Fort St. James Forest District, Fort St. James
R.G. MILLER,
Fort St. John Forest District, Fort St. John
C.L. NELSON,
Mackenzie Forest District, Mackenzie
R.M. HAWKINS,
McBride Forest District, McBride
R.G. TRENAMAN,
Prince George East Forest District, Prince George
K.W. MAGEE,
Prince George West Forest District, Prince George
K.E. ARNETT,
Vanderhoof Forest District, Vanderhoof

Prince Rupert Forest Region

Regional Manager

V.M. STRAIN*,
Smithers

District Managers

J.H. WENGER,
Bulkley Forest District, Smithers
G.I. BOWIE,
Cassiar Forest District, Dease Lake
G.F. DODD,
Kalum Forest District, Terrace
T.H. PETER,
Kispiox Forest District, Hazelton
A.R. PEMENT,
Lakes Forest District, Burns Lake
D.A. AMONSON,
Morice Forest District, Houston
J.G. WARD,
North Coast Forest District, Prince Rupert
T.A. DYER,
Queen Charlotte Islands Forest District, Queen Charlotte City

Vancouver Forest Region

Regional Manager

D.T. GRANT,
Vancouver

District Managers

D.E. deHART,
Campbell River Forest District, Campbell River
J.H. CARRADICE,
Chilliwack Forest District, Chilliwack
T.A. WALKER,
Duncan Forest District, Duncan
D.B. DOERKSEN,
Maple Ridge Forest District, Maple Ridge
R.W. THOMAS,
Mid-Coast Forest District, Bella Coola
R.A. CAMPBELL,
Port Alberni Forest District, Port Alberni
W.S. MILLWARD,
Port McNeill Forest District, Port McNeill
J.B. MOUNTAIN,
Powell River Forest District, Powell River
B.L. CUSTANCE,
Sechelt Forest District, Sechelt
N.P. GILGAN,
Squamish Forest District, Squamish

* Acting Capacity

II. Deputy Minister's Message

This Annual Report reviews the accomplishments and expenditures of the Ministry of Forests in the 1983–84 fiscal year. Comparisons are made with the goals and spending estimates set forth in the *Five-Year Forest and Range Resource Program, 1983–88*, which was submitted to the Legislative Assembly and published in July, 1983.

This message begins with a brief review of economic conditions during the year, providing a backdrop for the ministry's actions.

A Partial Recovery

A strong recovery in British Columbia's forest industries was widely anticipated for 1983–84, based on the previous year's low point in the longest and deepest recession since World War II. A recovery in production levels did occur, but prices did not perform satisfactorily.

Production of lumber, pulp and plywood rose substantially during 1983, in response to lower interest rates and a general economic recovery in the United States. British Columbia's lumber production reached a new record and lumber prices peaked briefly in June, but a continent-wide oversupply caused lumber prices to drop to a low level for the remainder of the year. Market pulp and newsprint production in the province approached previous records despite low prices. Structural changes in the panelboard market kept plywood production well below previous peaks and forced the permanent closure of several plywood mills during 1983–84. A more detailed discussion of the markets for forest products is included in the Harvesting Program report in **Section III**.

Relations between labour and management were tense, due to the recession and the anticipated recovery. Following a year of more than 25% unemployment among members of the International Woodworkers of America (IWA), the union and the management association agreed to a three year contract with no wage increase in the first year, followed by 4% and 4.5% increases in subsequent years. Members of the two unions in newsprint and pulp mills suffered less unemployment during the recession. After nine months of negotiations, the management association attempted to force a settlement by locking out union members. The lockout lasted two months, cutting severely into recovering corporate profits, and ended only with the help of legislation. The unions responded to the legislation with a one week strike. A contract similar to that of the IWA was finally agreed to almost three months later.

Industry's efforts to reduce costs and rationalize operations, which began in 1981, were continued in 1983. Several major companies restructured their balance sheets with new equity issues. Western Forest Products Limited was particularly innovative with its formation of the Western Pulp Limited Partnership.

Diversification of markets was a goal pursued by forestry trade missions sent to China and Europe. These missions consisted of high level officials from both industry and government. They sought potential new products which could be manufactured for export by the province's forest industry, and promoted trade by improving other countries' understanding of British Columbia's forest resources.

The Canada-British Columbia Subsidiary Agreement on Intensive Forest Management, which was due to expire on March 31, 1984, was extended for one year, following lengthy negotiations. Extension of this agreement provides $11 million, most of which will be spent on site rehabilitation and planting of not satisfactorily restocked (NSR) forest land.

The Canada-British Columbia Employment Bridging Assistance Program (EBAP), which enabled recipients of unemployment insurance to augment their incomes through voluntary participation in forest management projects, ended on June 30, 1983. The program's proven success prompted the federal government to continue funding the program on its own until September 30, 1983.

Ministry Expenditure, Revenue and Accomplishments

Declining forest revenues during 1981 and 1982 led to expenditure control during 1983–84 in the Ministry of Forests. Funding was reduced for most of the ministry's programs, with the exception of basic silviculture and fire suppression. This reflected an emphasis on the maintenance of forest resources, while limiting expenditure on other resource improvements.

Total expenditure by the ministry was $274.3 million in 1983–84, which was $30.9 million or 10% less than in 1982–83. This expenditure was funded from two sources:

Ministry of Forests budget	$215.2 million
Credits against stumpage revenue	$ 59.1 million
TOTAL	$274.3 million

All expenditure tables in **Sections IV and V** of this report are based on these two sources of funds.

A comparison of forecast and actual expenditure under the five-year program is shown in **Tables 1** and **2**, by program and forest region. Total expenditure was $27.3 million or 9% less than forecast in the five-year program.

The provision for the Fire Suppression Program was increased to $50.0 million in 1983–84, from $18.0 million in 1982–83 and $8.4 million in 1981–82. This major shift in budgeting brought all of the highly variable, open-ended funding under Section 124 of the Forest Act into the five-year program forecasts. The new forecast expenditure was expected to be sufficient for a severe fire season. In 1983–84, fire suppression expenditure was $25.1 million less than forecast, or only 50% of the new budget level. Excluding the Fire Suppression Program, actual ministry expenditure was within 1% of the forecast for 1983–84.

Differences between forecast and actual expenditures were small, typically much less than 10%, in the other programs and four of the forest regions. Actual expenditures in the Cariboo and Prince Rupert Forest Regions were somewhat lower than in the previous year, but still exceeded the sharply reduced forecast expenditure for 1983–84 by slightly more than 20%. Actual expenditures by the headquarters in Victoria were 36% less than forecast, in part due to the unspent half of the provision for fire suppression which is paid through headquarters.

The composition of actual ministry expenditure is detailed in **Tables 3** and **4**. Salaries and wages were reduced by 11% from the previous year, and accounted for 42% of total expenditure. Implementation of ministry programs through the private sector, wherever possible, resulted in 36% of total expenditure being for contract work and work by licencees for credit against stumpage. The remaining 22% were for materials, supplies and other operational expenses.

The ministry's staff was reduced significantly, in line with the government's plan to reduce the civil service by 25% and, ultimately, 30% from the 1982–83 staff level. To ensure smooth delivery of the ministry's services, the staff cutbacks reflected delegation of more responsibilities from the regional offices to the district offices.

Table 5 gives a detailed breakdown of forest and range revenue by forest region. Forest revenue in 1983–84 was $137.3 million after deduction of $59.1 million in Section 88 credit against stumpage. While this represents a 57% increase over the previous year, it still remains below half of the $360.8 million in 1980–81. A more detailed discussion of forest revenue is included in the Harvesting Program report in **Section III**. Range revenue was $1.2 million in 1983–84, continuing a slow but steady decline from $1.4 million in 1980–81.

The condition of forest land in British Columbia is summarized in **Table 6**.

Several tables appear for the first time in this annual report. **Table 7** is an important addition showing the area of land deleted from provincial forests by Order-in-Council. On the land deleted, land uses other than for forest and range resources have been deemed to provide greater social and economic benefits to the province. While the 1 187 hectares (ha) deleted may appear insignificant relative to the over 70 million ha in provincial forests, it is worth noting that many deletions are made in the far less abundant areas with high commercial potential for forest and range resources.

As in 1982–83, the Silviculture Program set new records in 1983–84 for the number of trees planted and the area planted: 112.5 million trees on 99 100 ha of Crown and private land.

The goals for tree planting on Crown land, as established in the five-year program, were not all met despite an 11% increase in the number of trees planted. The goals were 116 million trees planted on 95 200 ha. The 1983–84 accomplishments were 108.4 million trees planted on 94 700 ha. The shortfall in planting occurred on recently denuded land.

Other silvicultural treatments on recently denuded areas were increased substantially, compared to previous years. Brushing and weeding, and site preparation fell only slightly short of the ambitious goals set for 1983–84.

Goals for intensive silviculture treatments other than backlog planting were reduced substantially in 1983–84. Fertilization was eliminated. Accomplishments in other intensive silviculture treatments exceeded the reduced goals. Further details are given in the Silviculture Program report in **Section III**.

Under the Harvesting Program, a record 77.7 million cubic metres (m^3) of timber were harvested, of which 92% was harvested from Crown land. The volume of timber sold under the Small Busines. Enterprise Program continued to increase rapidly, rising by 32% to 5.8 million m^3 despite poor market conditions. The Small Business Enterprise Program was introduced in 1980 to promote competition and innovation in the forest industry by making timber available to small operators.

Two significant policy issues for the Harvesting Program were dealt with in 1983-84. First, the shifting of more forest management responsibilities to holders of tree farm licences was proposed in a discussion paper. Second, the ministry adopted a sympathetic administration policy to assist industry during the difficult economic climate of 1983-84. Further details are given in the Harvesting Program report in **Section III**.

The ministry's staff also administered a number of programs which were not part of the five-year program. The expenditures and accomplishments of these programs are excluded from the tables in **Sections IV and V**. The largest, EBAP, provided federal-provincial funding for assisting unemployed workers and increasing the productivity of the province's forest and range resources through intensive management which was incremental to the ministry's regular activities. Substantial improvements of range resources were implemented with the Agriculture and Rural Development Subsidiary Agreement (ARDSA), another federal-provincial initiative.

The *1983 Annual Report of the Ombudsman*, by Ombudsman K.A. Friedmann, describes several cases in which complaints against the ministry were resolved smoothly and cooperatively. The procedures and "stance" of the ministry appear to have been satisfactory in 1983. In February, 1984, the ombudsman issued a special report criticizing the ministry's handling of a problem with log scaling at Shoal Island. The ministry is currently addressing the ombudsman's recommendations.

The partial recovery of industry profits and government revenues from the recession of 1981 and 1982 has demonstrated the continuing importance of forest and range resources to the province's economy. The Ministry of Forests will continue to manage, protect and conserve these resources for the benefit of present and future generations.

T.M. Apsey
Deputy Minister

III. Program Reports

Management Program

The Management Program provides executive direction, control and information services for the ministry. The program includes the executive, Information Services Branch and Strategic Studies Branch in Victoria; regional managers, regional staff managers and information officers in the regional offices; and district managers, operations superintendents and support services supervisors in the district offices.

In 1983–84, actual expenditure was $10.7 million; $0.3 million less than forecast. Almost 90% of the expenditure was for salaries of the personnel in the program, with contracts, expenses and supplies accounting for the remaining 10%. Compared with the previous year, actual expenditure has been reduced by $0.7 million.

During 1983–84, considerable effort was addressed to planning, implementing and adjusting activities in recognition of the recession's impact on the forest industry. Staff reductions were made throughout the ministry and expenditure controls implemented. Where possible, steps were taken to aid and assist the forest industry in recovering from the poor markets in previous years.

Work progressed on the 1984 *Forest and Range Resource Analysis*, required under the Ministry of Forests Act. The resource analysis, a comprehensive assessment of British Columbia's forest and range resources, will be submitted to cabinet in the fall of 1984 and published in the spring of 1985.

The second exchange of timber harvesting rights under Section 51 of the Forest Act was completed in 1983–84. Through the exchange of 1.27 million m^3 of timber in remote timber licences for 1.34 million m^3 of unencumbered Crown timber closer to the licensee's other operations, resource management and development will be improved. Analysis and negotiations for future exchanges involving approximately 25.0 million m^3 of timber progressed during the year.

During the year, some information services were transferred from the ministry to a central agency providing government-wide information services. To reduce costs, the ministry cancelled *ForesTalk* magazine.

Finance & Administration Program

The objective of the Finance and Administration Program is to provide the ministry with an efficient financial and administrative support infrastructure. This includes financial management, electronic data processing systems, personnel services, staff safety and various para-legal, technical and equipment services. Buildings, grounds and offices for the entire ministry are provided by the Finance and Administration Program.

Forecast expenditure for 1983–84 for the Finance and Administration Program was $54.8 million; actual expenditure for the year was $54.1 million (*see* **Table A-1**). This included payments of $21.6 million to the British Columbia Buildings Corporation for buildings, grounds and offices throughout the province.

The *Five-Year Business Plan (1982–1987)* for the Finance and Administration Program sets goals for meeting the ministry's financial and administrative needs more efficiently, and emphasizes the links between the ministry's objectives, human and financial resources, and outputs. Further progress under this plan was made during 1983–84.

The accomplishments of the Finance and Administration Program during 1983–84 include the following:

- The ministry-wide Financial Management Information System was developed.
- Electronic word processing and data processing facilities were extended to all 46 district offices. A data network links all districts and regions to the Victoria computing facilities.
- Activities for women's programs were initiated at headquarters and regional centers.
- Work began on redesigning the revenue system and the first stages of a computerized inventory management system.
- The vehicle fleet was reduced by 30%.
- A revised nursery costing system was developed.
- Seven finance and administration policies were introduced.
- A Ministry Accident Prevention Manual was published.
- New goals were set to lower accident frequency.

The staff under the Finance and Administration Program also helped to plan and implement the ministry's staff reductions targeted for 1983–84 by the government (*see* **Tables A-2** and **A-3**).

Harvesting Program

The objective of the Harvesting Program is to make timber available to the forest industry in a manner consistent with the province's objectives for the use of forest resources, including the generation of revenue. The program provides an inventory of harvestable timber, planning of harvest levels, access to timber by engineering and building roads, management of timber tenures and cutting permits, scaling and valuation for billing of cut timber, and research related to harvesting.

Forecast expenditure for 1983–84 was $65.7 million; actual expenditure was $66.7 million (*see* **Table B-1**).

The level of expenditure reflects the continuation of a sharp curtailment, begun in 1981–82, of road construction to develop new areas. Section 88 road credits against stumpage declined to $13.7 million from $14.0 million in the previous year and $51.0 million in 1980–81. By concentrating harvest activity in previously developed areas, forest product companies were able to minimize delivered wood costs and avoid the cost of interim financing for major road projects.

Despite the relatively low level of road construction, engineering and roads represented 34% of 1983–84 expenditure in the Harvesting Program. Expenditure for scaling amounted to 16% or $10.7 million, most of which was recovered through scaling fees paid by the forest industry (*see* **Table B-2**).

Market demand for forest products recovered substantially in 1983–84, but prices remained low.

Lumber production rose 29% to a record 13.0 billion board feet during 1983. More than half of the lumber was exported to the United States, where lower interest rates, following the recession, prompted a surge in housing starts from 1.1 million in both 1981 and 1982 to 1.7 million in 1983. The resultant demand for lumber caused prices to rise rapidly through June, which brought many mills that had been shut down during the recession back into production. An oversupply of lumber resulted and caused prices to fall sharply. Prices remained low for the remainder of 1983 and dropped further, just after the end of the fiscal year, to the severely depressed levels experienced in 1981 and 1982. Overseas demand for North American lumber weakened in 1983 and did not ameliorate the excess production.

Pulp production in British Columbia rose 17% during 1983, in response to increased demand brought about by a general economic recovery in the United States and elsewhere. Newsprint production rose to within 4% of the 1978 record, despite low prices caused by large increases in capacity since 1979 in western North America. Market pulp shipments rose to within 3% of the cyclical peak in 1980, despite prices that were about 20% lower.

Plywood production rose in 1983, but still fell 22% short of the peak levels in 1978. Poor prospects for the plywood industry, due to high production costs and increasing availability of cheaper substitutes, forced the permanent closure of several mills during 1983–84.

The ministry adopted an administration policy to assist industry during the recessionary period by relaxing certain standards of timber utilization, cut control, harvest patterns and timber cruising.

A new "subsidiary agreement" was proposed in a ministry discussion paper. By shifting certain forest management responsibilities to holders of tree farm licences, the new voluntary agreement would increase the efficiency of forest management.

Forest revenue from the Harvesting Program increased 57% to $137.3 million in 1983–84 (*see* **Table B-2**). This level of revenue is overshadowed by the cyclical peak of $570.2 million in 1979–80, and even by the $360.8 million collected in 1980–81, between the peak and the recession.

The main cause of the relatively low forest revenue was the continued low level of stumpage prices, despite an increased demand for forest products. Minimum stumpage prices, set at a fixed percentage of prices for logs on the coast and lumber in the interior, remained in effect for most species throughout 1983–84 (*see* **Table B-3**). Coastal western red cedar was the only species for which stumpage rates increased significantly, in response to market forces, and exceeded the fixed percentage of minimum stumpage prices. Despite substantial increases in the market price of lumber products for a brief period in the first half of the fiscal year, more than 90% of appraisals in the interior set stumpage prices at minimum levels. As lumber prices rose, the stumpage minimums rose too, but the stumpage

prices did not exceed the minimums. The provincial average stumpage price for all species stayed near $2/m^3$ for the third year in a row. By contrast, this provincial average was above $7/m^3$ during the cyclical peak in 1979 and remained at $5/m^3$ in 1980–81.

The volume of timber harvested in 1983–84 increased 28% from the previous year, to a record 77.7 million m^3. Details of the timber harvest by land status and species are shown in **Tables B-5** and **B-6**.

The area harvested is shown in **Table B-7**, by forest region and harvest method. Private land not included in tree farm licences, certified tree farms and woodlot licences is included for the first time. The area harvested by clear cutting increased from 83% of the total in 1982–83 to 88% in 1983–84.

Log exports, shown in **Table B-8**, are usually countercyclical, increasing as a share of total harvest in years with poor markets and low harvests. In 1983–84, both the harvest and the share exported increased. Exports rose 51% to a record 2.5 million m^3.

Activity under the Small Business Enterprise Program in 1983–84 is shown in **Tables B-4** and **B-9**. The volume billed under this program increased by 54% to 3.9 million m^3. The volume sold increased by 1.4 million m^3 to 5.8 million m^3, which is 18% more than the annual volume apportioned to the program under the allowable annual cut.

The number of licences administered during the year and the commitment associated with those licences are shown in **Tables B-10** and **B-11**.

Two new tables (**B-12** and **B-13**) concerning forest service roads and bridges are included in this annual report. **Table B-12** summarizes the class 1, 2 and 3 roads for which the ministry is responsible. The ministry's class 4 and 5 roads, which form an extensive network providing access for harvesting and other activities, are not shown in the table. **Table B-13** summarizes the bridge inventory. Roads and bridges are a very important component of the Harvesting Program and these tables provide data on the construction, improvement and inventory of roads and bridges. During 1983–84, 93 kilometres (km) of double lane roads and 33 bridges were constructed, and 8 km of double lane road were improved. Transfers of responsibility for roads and bridges, from the ministry to another agency or from elsewhere to the ministry, are also shown.

Silviculture Program

The objectives of the Silviculture Program are to restock denuded land and to improve the value and productivity of forest stands through silvicultural treatments. Denuded land is restocked through natural seeding and planting. Site preparation is frequently used to promote natural restocking and to facilitate planting. Brushing and weeding is carried out on some plantations to ensure unimpeded growth of seedlings. Spacing, fertilization and conifer release are among the treatments used on forest stands to improve their value and productivity.

Forecast expenditure for 1983–84 was $90.4 million; actual expenditure was $88.0 million.

A record 112.5 million tree seedlings were planted in British Columbia during 1983–84, an increase of 7.2 million trees over the previous year. Of these, 108.4 million trees were planted on 94 728 ha of Crown land. Approximately 88% of the planting on Crown land was on land recently denuded (basic silviculture); the remaining 12% was backlog planting (intensive silviculture). The remaining 4.1 million trees were planted on 4 415 ha of private land.

Under the terms of the Canada - British Columbia Subsidiary Agreement on Intensive Forest Management, the federal government contributed $5.0 million toward enhancement of the forest resource base of the province through the implementation of intensive forest management, particularly for backlog reforestation and juvenile spacing. Silvicultural treatments funded by this

agreement are included in this report on the Silviculture Program.

The Silviculture Program consists of four components.

Basic Silviculture

For Crown forest land, the goals and accomplishments in basic silviculture for 1983–84 were:

Activity	Goals	Accomplishments
	(hectares)	
Surveys[1]	N/A[2]	300 467
Site Preparation	76 600	74 309
Planting	85 000	84 263
Brushing & Weeding	8 600	7 054

[1] Includes surveys of basic and backlog plantations and surveys of natural restocking on basic and backlog Crown land.

[2] Not available. No goal for surveys was published in the five-year program.

During 1983–84, the ministry and licensees surveyed a total of 300 467 ha of Crown forest land. Some 66% (197 350 ha) of the area surveyed was found to have sufficient commercially valuable trees to be classified as satisfactorily restocked. A small area, about 1% (2 873 ha), was found to be non-productive. The remaining 33% (100 244 ha) of the area surveyed will be planted, rehabilitated and planted, or site prepared for natural restocking, depending on the results of the survey. Further information is provided in **Tables C-2** and **C-3**.

Recently denuded areas are inspected to determine if site preparation is necessary to obtain natural restocking or to prepare land for planting. Site preparation to promote natural restocking increased in 1983–84 to 18 702 ha (*see* **Table C-4**). An additional 27 737 ha were assessed and found not to require treatment to promote natural restocking. Site preparation for planting in 1983–84 increased to 55 607 ha (*see* **Table C-5**). An additional 10 444 ha were deemed not to require any treatment prior to planting.

The goal for planting on Crown forest land was almost met in 1983–84, with 95.9 million trees planted on 84 263 ha (*see* **Table C-6**). An additional 4.1 million seedlings were planted for basic silviculture on 4 302 ha of private land.

Brushing and weeding treatments to control undesirable vegetation in young stands were conducted on 7 054 ha in 1983–84 (*see* **Table C-7**). Brushing and weeding treatments were concentrated in the Vancouver Forest Region where brush encroachment on very productive sites is a serious problem.

Average costs of basic silviculture treatments are detailed in **Table C-9**. Rising equipment costs and smaller treatment areas resulted in higher average costs for site preparation, and brushing and weeding.

Intensive Silviculture

For Crown forest land, the goals and accomplishments in intensive silviculture for 1983–84 were:

Activity	Goals	Accomplishments
	(hectares)	
Backlog Planting	10 200	10 465
Spacing[1]	3 600	6 753
Fertilization	—	—
Site Rehabilitation	600	1 792
Conifer Release	400	609
Thinning	—	8

[1] Includes juvenile and sanitation spacing.

Restocking of a backlog of forest land that has been denuded for several years is one of the ministry's important activities which is funded in part by the federal government. In 1983–84, 12.5 million trees were planted on 10 465 ha of backlog Crown land (*see* **Table C-6**). An additional 12,000 trees were planted on 113 ha of backlog private land.

A total of 9 460 ha of Crown land was treated in 1983–84 to improve the value and productivity of forest stands (*see* **Table C-8**). Spacing treatments were concentrated in fast growing stands of high potential value in the Vancouver Forest Region. Spacing immature stands removes excess trees which compete for nutrients and light, allowing growth to be concentrated on the remaining crop trees. No fertilization was carried out in 1983–84.

Thinning was curtailed during 1983–84, due to a lack of markets for the small trees harvested in this treatment.

Average costs of intensive silviculture treatments are provided in **Table C-9**. The cost of spacing in the Vancouver Forest Region was lower than in the previous year due to increased competition for contracts. The increased competition was partly due to high unemployment in the forest industry. The average cost of conifer release in the Vancouver

Forest Region was lower than in the previous year due to a higher proportion of aerial spray treatments.

Nursery Operations

In preparation for future planting requirements, the ministry's nurseries sowed for 110.1 million seedlings during 1983–84. Private nurseries sowed for an additional 38.8 million seedlings.

Some sites require larger planting stock which can compete successfully with other vegetation. Ministry nurseries transplanted 14.2 million seedlings in 1983–84 for that purpose. Private nurseries transplanted an additional 9.5 million seedlings.

Seed Operations

In the fall of 1983, natural spruce stands in the north-central area of the province produced a moderate to heavy crop of cones. There were scattered crops for other species throughout the province. Seed yields from these spruce collections were significantly higher than normal. Germination rates were also very high.

The cone collection from natural stands was of medium size and produced 6 673.3 kilograms (kg) of seed (*see* **Table C-10**). A record cone collection from seed orchards produced 590.0 kg of seed. Seed withdrawals of 2 203.5 kg during 1983–84 left the seed inventory with 44 158.2 kg at the end of the year.

Two new seed orchards were established during the year, bringing the total number of orchards at March 31, 1984, to 37, covering 108.5 ha. The ministry funds 29 of these seed orchards, covering 92.0 ha; of these, 13 are funded through Section 88 and cover 32.6 ha. The Coastal and Interior Tree Improvement Councils, consisting of representatives from forest industry firms and the ministry, were active in advising the chief forester on tree improvement and seed orchards.

A comprehensive report was prepared which reviewed several options for extracting and processing seed in the future. The construction of a new facility is recommended.

Research Program

The Research Progam provides the ministry and other government agencies with improved scientific knowledge and methods for achieving objectives in forest and range management.

Forecast expenditure for 1983–84 was $7.7 million; actual expenditure was $8.4 million. This excludes expenditures devoted to research which have been allocated directly to other programs.

Research into silvicultural issues focussed mainly on managed stand growth and yield, forest vegetation management and white spruce reforestation. First approximation yield tables for plantation establishment density and juvenile spacing of coastal Douglas-fir and interior lodgepole pine were further refined for publication in 1984–85. Development of growth and yield methodology to support timber supply area analyses continued. Significant progress was made in the analysis of 6-year responses to thinning and fertilization treatments in the forest productivity installations. Forest vegetation management research is expanding in most regions. Direct control methods such as manual or mechanical brush cutting and herbicide treatment are being investigated, as are forest establishment systems to optimize inputs to plant stress resistance and site stress reduction. Development of a classification system for seral vegetation is in progress. A major interdisciplinary investigation into the ecophysiology of white spruce establishment began at Coal Mine Road near Prince George. First approximation guidelines for fall planting in the Vancouver Forest Region were prepared.

In nursery physiology research, benefits of studies on reduced bare root seed bed densities have been transferred to operational nursery practice through newly available New Zealand and German precision seeders purchased by Silviculture Branch. Cost reduction and increased container nursery production of western red cedar is being achieved by seed pelleting to allow mechanized sowing, and by chemical root pruning in styro-block containers. Control of flowering for earlier and more complete access to genetic gain has been largely achieved, and operational container-shelter house seed orchards of western hemlock, interior spruce and possibly Douglas-fir now appear technically feasible.

Biometrics and systems developments included an optimization and simulation technique to provide a potentially effective tool to help optimize resource utilization in nursery stock production. Advances were made on the application of optimal control theory to forest protection programs and the development of an error analysis procedure and triangulation techniques for the lightning locator system.

In the ecosystem classification program, publication of field guides and interpretative reports continued but sampling and training was limited in all regions. Phase I progress reports for the Integrated Wildlife Intensive Forestry Research Program are in preparation and planning for Phase II has been initiated. A second partial forest cutting experiment to maintain mule deer habitat and produce timber was carried out and a techniques handbook is in preparation. Final reports for several components of the Fish/Forestry Interaction Program on the Queen Charlotte Islands are nearing completion. This program was begun in 1981 in cooperation with the British Columbia Ministry of Environment and the Canada Department of Fisheries and Oceans. A problem analysis on range research needs is now ready for publication. Several interagency meetings took place during the year on decision making procedures and information needs for rate-of-cut determination in forested watersheds.

A major change in the tree improvement program during 1983 was the greater reliance upon cooperation from the private sector. This enabled the completion of scheduled assessments and maintenance of all test plantations. Major programs for the selection and progeny testing of parent trees were implemented for interior spruces, interior Douglas-fir and lodgepole pine. The first successful matings on flower-induced, containerized ramets of western hemlock were completed at the Cowichan Lake Research Station. Estimation of genetic parameters from Douglas-fir test data validated the primary breeding strategy of recurrent selection in half diallels. Provenance information permitted the revision of seed transfer rules and the broadening of seed orchard zones for interior spruce. Provenance information also guided the introduction of desirable seedlots for operational planting and desirable clones for the enrichment of breeding populations and seed orchards of Sitka spruce, interior spruces, lodgepole pine and Douglas-fir. Facilities for research, propagation and clonebanks were operated at Vernon, Cowichan Lake and Red Rock.

The results of experiments in field studies conducted under the Research Program are published each year in the *Forest Research Review*.

Forest Protection Program

The basic objective of the Forest Protection Program is to protect the forest and range resources of the province from damage by wildfire and pests, especially insects and diseases. Other important concerns are the protection of life and property, the preservation of other natural resource values, and the use of prescribed fire to support resource management objectives. There are five activities within the program — administration; fire management; pest management; air operations; and planning, development and research.

Forecast expenditure for 1983–84 was $13.9 million; actual expenditure was $14.3 million (*see* Table D-1).

For wildfire, the annual provincial goal in the *Five-Year Forest and Range Resource Program* is to keep the area burned below 69 000 ha and the wood volume loss below 2.6 million m^3. In 1983–84, the actual area burned was 67 380 ha and the wood volume loss was 5.4 million m^3. Cariboo, Kamloops, Nelson and Vancouver Forest Regions met basic fire control goals. Prince Rupert and Prince George Forest Regions exceeded both their area burned and timber loss goals. The northern portions of the province again experienced early season drought conditions and record breaking temperatures, making fires extremely difficult to control. It was here that most of the area burned and timber losses occurred. Tables D-2 through D-4 provide wildfire and damage statistics for each forest region.

For pests, the objectives in the five-year program are to establish and maintain a comprehensive pest management organization in the ministry and to build an effective program to reduce wood losses caused by pests such as bark beetles, defoliators, mistletoes and diseases. Staff are in place at headquarters, regions and many districts. Problems have been identified and activities are underway to reduce pest losses. A recent accomplishment was the determination of more accurate pest losses for each timber supply area. Tables D-5 and D-6 indicate estimated damage due to major forest pests in the province.

Fire Management

The number of fire prevention messages aired during the fire season on television and radio was reduced. However, the campaign directed at junior school levels proceeded as planned. Sixteen copies of the film entitled "Smokey The Bear", together with supplies of pencils having a fire prevention message were distributed to field offices. Four new posters were designed and distributed which dealt with smokers, campers, forest home dwellers and the Zenith 5555 public fire-reporting telephone number. The film "Black and Green", which portrays the varied benefits of prescribed fire, was dubbed onto video tapes for wider use within regions and districts. Supplies of existing information pamphlets dealing with protection subjects were reprinted, and a new brochure on burning permit requirements and procedures was published. A new highway forest fire prevention message sign was designed.

The Series 100 fire suppression training modules were improved. Production of the Series 200 is underway. An advanced Fire Management Course was prepared and received accreditation by the Academic Standards Committee of the Association of British Columbia Professional Foresters. The first course was presented at the Forest Service Training School in March of 1983. Candidates who pass the examination and meet other requirements receive credits equivalent to the university forestry course in this subject.

In fire detection, 60 lookouts were manned for a total of 2,739 days during the fire season and 3,328 hours of aircraft patrol were flown. The use of airborne infrared scanners to detect spring hangover fires in log landings continued to be cost-effective. Out of 5,446 landings scanned, 194 hot landings were discovered and those fires were subsequently extinguished.

The use of prescribed fire to accomplish resource management objectives, a long-standing treatment option in forest management, is expanding among other resource agencies. Broadcast burning during the year amounted to 93 000 ha, of which 37% was conducted for silvicultural purposes, 30% for range improvement, 30% for wildlife habitat management, 3% for abatement of hazardous forest fuels and a minor amount for forest pest control. In addition to broadcast burns, many burns were undertaken that involved only a small local treatment such as piling and burning, or other spot burns.

Pest Management

Bark beetles, notably the mountain pine beetle and spruce beetle, continued to be the most destructive forest insects currently active in the province. As emergency funding was discontinued, many planned control operations had to be cancelled. Nevertheless, bark beetle problems received the highest priority, and aerial and ground surveys of them continued. Pheromones are now considered an effective operational technique and were used to improve the effectiveness of sanitation harvesting, trap tree and containment activities. Beetle infestations are not expected to decline in the near future.

The Douglas-fir tussock moth infestation in the southern interior increased its boundaries. A Grant-in-Aid program was instituted whereby private landowners wishing to control this insect defoliator were reimbursed 50% of their spray control costs. Administration of this program was provided by five regional districts, with active support from ministry staff at all levels. The virus specific to the tussock moth received federal registration for forestry

applications and this effective biological control agent will be available for use against future outbreaks. Surveys indicate that the tussock moth outbreak should collapse in 1984.

Tables D-5 and D-6 provide estimates of the area under attack and timber damaged by major pests.

Dwarf mistletoe control projects continued and additional demonstration areas were established in some interior regions. Pruning trials were conducted on white pine in the Nelson and Vancouver Forest Regions to determine the effectiveness of this treatment in reducing the occurrence of white pine blister rust. Surveys were carried out to improve knowledge on the occurrence of root diseases, and training sessions were held with field personnel in identifying and evaluating root diseases. The two-year survey and clipping program for the spruce weevil in Sitka spruce plantations was completed in the Vancouver Forest Region. Hazard zones have been delineated and management guidelines prepared.

The ministry representative on the British Columbia Pesticide Control Committee reviewed and made recommendations to the Ministry of Environment on 664 applications for pesticide use, of which 239 were from the Ministry of Forests, 121 from the forest industry and 304 from non-forestry users.

The expertise and support of the Canadian Forestry Service in the ministry's pest management activities is acknowledged.

Air Operations

Total air operations expenditures of the ministry amounted to $14.4 million. The Fire Suppression Program spent $11.7 million, or 81% of this, on helicopter transport and supply services, air tanker bombing of fires, aerial fire detection patrols, and air tanker bases (*see* Table D-7 for breakdown by forest region). The Forest Protection Program spent $0.8 million, predominantly for wages (shown under Air Operations in Table D-1), and for general protection flying. The remaining $1.9 million were spent on the flying requirements of other ministry programs.

The capital works program included completion of the relocated Prince George air tanker base and the new Dease Lake base as well as the installation of fuel storage facilities at the Smithers and Williams Lake bases.

The manager of air operations spent six weeks in Australia, at the invitation of the forest research division of the Commonwealth Scientific and Industrial Research Organization (CSIRO), to participate in their project Aquarius. The objective of this project, located in the State of Victoria, was to evaluate the effectiveness of large air tankers using long-term retardants under Australian wildfire conditions.

The ministry's provincial rapattack program was operational again using helicopters and rappel techniques. The 28 crewmen were trained in early May at the provincial training base at Salmon Arm. Two Bell 205 multipurpose helitankers were contracted for quick deployment of the seven 4-member crews. The crews took action on 84 fires in 1983, the majority of which were in the Salmon Arm and Fort Nelson areas. Initial attack was considered successful on all 84 fires with an average direct cost of $3,200 per fire.

In conjunction with the rapattack program, an off-load system for the helitanker was operationally tested on 60 fires. The system consists of a helicopter pumping system and a 300-gallon reservoir suitable for steep slopes, complete with a lightweight power pump. The helitanker empties its tanks via lightweight hose into the ground reservoir, making 300 gallons of water available for hot spotting and mop-up by crews on the ground.

In addition to the ministry's provincial rapattack crew, a contract rappel team consisting of nine men with a Bell 206L-1 helicopter was located at Revelstoke in the Nelson Forest Region. This crew took action on 18 fires in the Nelson, Kamloops and Prince George Forest Regions.

The ministry experienced only one aircraft accident during 1983. Unfortunately, this accident claimed the life of a helicopter pilot who was carrying out a bucketing operation on a forest fire in the Vancouver Forest Region.

Planning, Development and Research

The lightning location system was expanded from 11 to 15 sites, completing the provincial network of direction finders. All regions and Victoria headquarters can now electronically plot lightning strikes on demand. The system was introduced in four districts to determine the information requirements best suited for district fire detection and initial attack. The lightning system will be brought on-line to additional districts in 1984.

Training sessions were begun at districts and regions as an extension to the fire ecology reports for the Fort Nelson, Cassiar and Mackenzie Timber Supply Areas. These sessions involved concepts,

interpretations and use of the vegetation, soils, and fire-ecological relationships for improving fire management practices.

Work commenced on a literature review of dry belt Douglas-fir and ponderosa pine prescribed fire use and fire ecology relationships; and on the development of methods for data collection on prescribed burns.

A project to determine the timber and property values which may be lost to wildfire is well underway. A computer system will estimate fire risk to these values, based on potential fire behaviour. The system will link the provincial forest inventory, forest stand history and property assessment data bases to a fire model utilizing data on weather, forest fuels and topography. A grid system with 400 ha cells has been chosen. The system will be tested in one interior timber supply area in 1984.

Fire statistics were used to develop a model to determine firefighting tool and equipment requirements for all districts, regions and the provincial cache. Stocking levels have now been established. A similar process was used to determine the types, sizes and location of all initial attack crews. Updated standards for each district and region were recommended.

Regional planning activities were primarily devoted to five-year programs, fire control plans, and management and use of the protection management information systems.

Fire Suppression Program

The ministry's responsibility to minimize damage from wildfires burning in the province's forest and range land is carried out through the Fire Suppression Program. This program is closely linked to and supported by the Forest Protection Program, but is separately managed and funded.

Annual fire control goals for area burned and timber volume loss were met in the Cariboo, Kamloops, Nelson and Vancouver Forest Regions. A discussion of the performance is in the Forest Protection Program report. **Tables D-2** through **D-4** provide wildfire statistics for each region.

Fire suppression costs for the year amounted to $24.9 million, a significant drop from the two previous years, which averaged over $40 million each year (*see* **Table D-7**).

The fire season in 1983 started on a severe note. Late April and all of May were dry with record breaking temperatures occurring on May 30. Many stations reported new high temperatures for May and some recorded all-time high values in the 30° - 36° C range. Northern areas of the province experienced severe fire conditions very quickly, because of the long hours of sunshine at these times, and many fires became large. The Swiss Fire near Houston had the greatest impact. This fire covered 18 000 ha, including large areas of mature timber and plantations, and destroyed five rural residences and other buildings. Almost all the provincial area burned occurred by early June. Firefighters saw action all summer, but showers kept conditions in a state where control actions were successful. For the full season, fire occurrence was down 28% from the latest 10-year average.

At peak periods in the fire season, over 1,700 men and 200 tractors and other heavy equipment were employed on fire lines, supported by 48 helicopters and 18 air tankers. The air tanker fleet dropped 4.2 million litres of fire retardant on 233 fires.

Nine campfire closures were imposed during the season. One full forest-use closure was ordered in the vicinity of the Swiss Fire to ensure the safety of residents and travellers.

A new fire control and air operations "war room" was completed at Victoria headquarters. The large operations area contains illuminated panels which display weather forecasts, lightning occurrence, location and status of major fires, aircraft locations and state of alert, forest closure zones, stocking levels of equipment and other resources, and available resources of other protection agencies in the event that mutual aid is required.

Mutual aid between fire control agencies was facilitated through the Canadian Interagency Forest Fire Centre at Winnipeg. British Columbia assisted Ontario with the loan of pumps, hose and other firefighting equipment. Two wildfires in the Yukon were suppressed by British Columbia forces for which reimbursement was made.

Range Management Program

The objective of the Range Management Program is to supply forage for domestic and wild ungulates, while conserving the resource base so that future forage production will continue in a manner consistent with multiple use goals for Crown lands. In 1983–84, grazing permits and grazing licences for livestock authorized use of 994,985 Animal Unit Months (AUMs). This again exceeded the goal of 934,000 AUMs in the *Five-Year Forest and Range Resource Program* and was 5,430 AUMs more than the previous year's authorized use.

Forecast expenditure for 1983–84 was $4.3 million; actual expenditure was $3.8 million (*see* **Table E-1**). The private sector contributed an additional $0.6 million to range improvements on Crown land, through cost sharing agreements with the ministry.

Range Management staff also administered the expenditure of a further $2.6 million for range improvements which are not included in the remainder of this report or the detailed statistical tables. Under the Canada-British Columbia Employment Bridging Assistance Program, approximately $0.3 million was expended with an emphasis on fence construction and maintenance. The Agriculture and Rural Development Subsidiary Agreement (ARDSA), a joint Canada-British Columbia initiative, provided approximately $2.3 million for work under Coordinated Resource Management Plans (CRMPs). During the year, 46 plans were implemented, of which 3 were initiated in 1983–84. Fourteen CRMPs were completed in 1983–84, for a total of 100 completed to date. These plans cover 5.5 million ha and have contributed to the resolution of many problems resulting from multiple use of Crown range. Total ARDSA expenditures on range improvements from 1977 to 1983–84 have been on the order of $16.3 million.

The North American cattle industry maintained the general price level and cattle numbers of the previous year. However, the continuing devaluation of the Canadian dollar increased the nominal Canadian prices for livestock, inputs purchased from the United States and feed stuffs which are subject to United States markets.

In British Columbia, range revenue from permits and licences for Crown range was $1.2 million in 1983–84, about 9% lower than in the previous year (*see* **Table E-2**). The ground rent, $0.20 per AUM, was the same as in the previous year, but the fee, which is related to cattle prices of the previous year, decreased to $1.03 per AUM from $1.16 per AUM in 1982–83.

Grazing permits and grazing licences in 1983–84 are summarized in **Table E-3**. Utilization was 937,765 AUMs; 94% of the authorized use.

Hay cutting permits and hay cutting licences in 1983–84 are summarized in **Table E-4**. Most of the authorized hay cutting permits and hay cutting licences are for wetlands in the interior of the province. At 88% of authorized use, utilization was high relative to average years because of the shortage of feed, damage to first cut hay and increased accessibility of meadows for fall harvesting.

Range improvements on Crown land funded by the ministry during the year are shown in **Table E-5**.

Seeding was carried out on 6 132 ha of disturbed forest sites and on 922 ha for grassland rehabilitation. In biogeoclimatic zones where research has been conducted, seeding clearcuts and grazing cattle has not significantly affected forest production while cost-effectively increasing forage production for domestic and wild ungulates. Most of the seeding of disturbed forest lands in the Kamloops Range District was shifted from late winter to early spring. Consequently, the area seeded in fiscal year 1983–84 was low, and most of the seeding for establishment in the summer of 1984 will be reported in 1984–85. The shift in timing will result in more effective establishment.

Weed control, principally for knapweed (247 ha) and thistle (25 ha), was cut to half the level in the previous year. Knapweed control works mainly by containment and is very cost-effective. Due to insufficient control, knapweed has spread from approximately 30 000 ha in 1974 to over 80 000 ha in 1983.

The average costs of seeding, fence construction and weed control are shown in **Table E-6**. Cost sharing with private operators reduced the cost to the ministry in some cases, especially the seeding of community pastures in the Prince George Range District and fence construction in all districts.

Range inventory work included field sampling of 38 700 ha and processing of data for computer retrieval. Research continued on biological control of knapweed. The Research Branch continued research projects on range topics.

Recreation Management Program

The objectives of the Recreation Management Program, within the ministry's integrated resource use framework, are to maintain and enhance recreational values (including the aesthetic values of the forest landscape) and to provide a system of sites and trails to facilitate public recreational use of Crown lands.

Forecast expenditure for 1983–84 was $3.8 million; actual expenditure was $3.3 million (*see* **Table F-1**). The provision and maintenance of sites and trails was reduced.

Additional funding and labour was provided by federal-provincial job creation programs such as the Canada-British Columbia Employment Bridging Assistance Program and, to a lesser extent, by local volunteer groups. This additional work, valued at $1.3 million, was of major assistance in minimizing deterioration of facilities. It is not included in this report on the Recreation Management Program.

Resource Management

Expenditure reductions were kept to a minimum in the management function, due to the importance of identifying, protecting and managing recreational values. These values exist in areas which are visually or environmentally sensitive, and in features which have cultural, historical or other recreational significance.

The inventory of recreational and aesthetic values was continued. A preliminary inventory was completed for the whole province and summarized for inclusion in the 1984 *Forest and Range Resource Analysis*. A policy was drafted which confirms the ministry's commitment to resource management for many types of recreation, ranging from activities on developed sites to wilderness experience. This commitment was incorporated in the proposed "subsidiary agreement", to ensure consideration of recreational resources on forest land managed by licensees.

Site and Trail Maintenance

Site maintenance was reduced in 1983–84. Only 1,016 sites, or 114 less than in 1982–83, were maintained (*see* **Table F-2**). The reduction in the number of sites maintained and a lower intensity of maintenance on the serviced sites led to a decrease of approximately 100,000 user days in recorded site visits.

The length of trails maintained was increased by 477 km to 1 727 km in 1983–84, including some 780 km of trails maintained by volunteer and make-work programs. Maintenance was largely limited to annual inspection of trails and abatement of prominent hazards. Actual upkeep was minimal, so the average cost of trail maintenance dropped to between $50 and $60 per km.

As in previous years, most of the visitors at sites and trails managed by the ministry were provincial residents.

The problem of vandalism near urban centres continued to consume significant portions of maintenance funds in some districts.

Site and Trail Development

Development of new sites and trails was very limited. Emphasis was placed on maintaining existing developments rather than making new ones.

IV. Summary Statistical Tables

NOTE: All financial data for 1983–84 contained in Section IV are unaudited. Totals in certain tables are not equal to the sum of their components due to rounding.

Table 1: Forecast and Actual Expenditure in 1983–84, by Program

Program	Forecast Expenditure[1]	Revised Forecast Expenditure[2]	Actual Expenditure[3]
	(thousands of dollars)		
Minister	144	144	138
Management	10,968	10,831	10,726
Finance and Administration	54,817	55,308	54,367
Harvesting	65,660	66,920	66,722
Silviculture	90,350	89,118	87,991
Research	7,701	7,820	8,398
Forest Protection	13,886	13,909	14,266
Fire Suppression	50,000	50,000	24,863
Range	4,312	4,261	3,829
Recreation	3,778	3,305	3,349
TOTAL	301,616	301,616	274,349

[1] Forecast expenditure in the *Five-Year Forest and Range Resource Program*, July 22, 1983.
[2] Adjustments reflect minor changes in priorities.
[3] Includes all expenditures under the five-year program. Funds are from two sources:
(i) Ministry of Forests budget ..... $215.254 million
(ii) Expenditures by licensees approved under Section 88 of the Forest Act ..... $ 59.095 million
Excludes expenditures under the province's Employment Development Account for:
(i) Employment Bridging Assistance Program ..... $2.477 million
(ii) Mechanical Site Preparation ..... $1.500 million

Table 2: Forecast and Actual Expenditure in 1983–84, by Forest Region

Forest Region	Forecast Expenditure[1]	Revised Forecast Expenditure[2]	Actual Expenditure[3]
	(thousands of dollars)		
Cariboo	18,641	18,620	22,463
Kamloops	22,794	22,636	25,027
Nelson	21,604	21,578	22,890
Prince George	38,571	38,431	42,498
Prince Rupert	25,089	25,055	31,046
Vancouver	42,413	42,384	46,154
Victoria	132,504	132,912	84,271
TOTAL	301,616	301,616	274,349

[1] Forecast expenditure in the *Five-Year Forest and Range Resource Program*, July 22, 1983.
[2] Adjustments reflect minor changes in priorities.
[3] Includes all expenditures under the five-year program. Funds are from two sources:
(i) Ministry of Forests budget ..... $215.254 million
(ii) Expenditures by licensees approved under Section 88 of the Forest Act ..... $ 59.095 million
Excludes expenditures under the province's Employment Development Account for:
(i) Employment Bridging Assistance Program ..... $2.477 million
(ii) Mechanical Site Preparation ..... $1.500 million

Table 3: Composition of Actual Expenditure in 1983–84, by Program

Program	Wages & Salaries: Permanent Staff	Wages & Salaries: Temporary & Aux. Staff	Materials, Supplies & Expenses	Contracts	Section 88	Total
			(thousands of dollars)			
Minister	132	3	3	—	—	138
Management	9,330	184	1,045	167	—	10,726
Finance and Administration	16,392	4,907	30,620[1]	2,148	—	54,067
Harvesting	32,207	7,179	7,426	4,603	15,307	66,722
Silviculture	9,925	10,203	8,993	16,748	42,122	87,991
Research	2,617	2,941	1,396	918	526	8,398
Forest Protection	5,394	3,954	2,645	1,196	1,077	14,266
Fire Suppression	1,276	3,924	5,387	14,276	—	24,863
Range	1,993	488	1,006	342	—	3,829
Recreation	1,472	866	611	337	63	3,349
TOTAL	80,738	34,649	59,132	40,735	59,095	274,349

[1] Includes $21.563 million paid to the British Columbia Buildings Corporation for building occupancy charges throughout the province.

Table 4: Composition of Actual Expenditure in 1983–84, by Forest Region

Forest Region	Wages & Salaries: Permanent Staff	Wages & Salaries: Temporary & Aux. Staff	Materials, Supplies & Expenses	Contracts	Section 88	Total
	(thousands of dollars)					
Cariboo	7,319	3,789	3,526	2,949	4,880	22,463
Kamloops	8,259	3,933	3,497	2,613	6,725	25,027
Nelson	8,295	3,770	2,596	3,275	4,954	22,890
Prince George	10,199	3,996	4,734	6,941	16,628	42,498
Prince Rupert	8,506	4,278	5,512	4,257	8,493	31,046
Vancouver	15,872	5,048	8,389	5,091	11,754	46,154
Victoria	22,288	9,835	30,878[1]	15,609	5,661	84,271
TOTAL	80,738	34,649	59,132	40,735	59,095	274,349

[1] Includes $21.563 million paid to the British Columbia Buildings Corporation for building occupancy charges throughout the province.

Table 5: Forest and Range Revenue in 1983–84, by Forest Region[1]

Forest Region	Forest Revenue[2]	Range Revenue	Total Revenue
	(thousands of dollars)		
Cariboo	8,243	457	8,700
Kamloops	10,161	413	10,574
Nelson	6,844	99	6,943
Prince George	12,727	162	12,889
Prince Rupert	18,449	40	18,489
Vancouver	74,506	2	74,508
Victoria	6,336	—	6,336
TOTAL	137,266	1,173	138,439

[1] Forest and range revenue in Tables 5, B-2 and E-2 is presented on an accrual basis.

[2] Forest revenue is net of credits against stumpage which equaled $59.095 million in 1983–84. Gross Total Revenue totalled $197.534 million. Credits approved by program and forest region are shown in Tables 3 and 4 under the column heading "Section 88".

Table 6: Forest Land in British Columbia, by Forest Region[1]

Forest Region	Mature	Immature	NSR[2]	NC Brush[3]	Other[4]	Total
			(thousands of hectares)			
Cariboo	3 534.8	2 686.4	155.4	19.0	80.5	6 476.1
Kamloops	2 241.9	1 974.9	130.7	19.7	20.5	4 387.7
Nelson	1 335.7	2 084.9	241.8	21.0	80.3	3 763.7
Prince George	7 840.7	8 235.7	196.7	627.0	396.7	17 296.8
Prince Rupert	8 700.7	2 340.7	344.0	75.1	204.1	11 664.6
Vancouver	2 181.6	1 450.6	88.2	6.0	98.2	3 824.6
TOTAL	25 835.4	18 773.2	1 156.8	767.8	880.3	47 413.5

[1] Source: *Forest and Range Resource Analysis Technical Report*, March 1980.
Excludes:
(i) Crown forest land in old temporary tenures and timber licences which are outside tree farm licences,
(ii) private forest land outside tree farm licences, and
(iii) federal forest land.

[2] Not Satisfactorily Restocked. Stands which have been disturbed over 75 percent by fire, logging or other causes and have not restocked with sufficient trees of commercial species.

[3] Non-Commercial Brush. Areas that have been invaded and covered by brush and non-commercial species.

[4] Includes non-productive timber, non-commercial timber, and residual stands following logging.

Table 7: Deletion of Land from Provincial Forests in 1983–84, by Forest Region

Forest Region	Designated Use of Land Deleted					
	Agriculture	Industry and Transportation	Parks and Recreation	Settlement	Other[1]	Total
			(hectares)			
Cariboo	65	—	—	2	—	66
Kamloops	—	74	662	43	—	779
Nelson	11	—	—	8	—	19
Prince George	12	138	5	1	—	156
Prince Rupert	—	8	—	2	—	10
Vancouver	—	12	—	1	143	157
TOTAL	88	233	667	56	143	1 187

[1] Correctional campsite.

V. Detailed Statistical Tables

NOTE: All financial data for 1983–84 contained in Section V are unaudited. Totals in certain tables are not equal to the sum of their components due to rounding.

Table A-1: Finance and Administration Expenditure in 1983–84, by Forest Region

Forest Region	Financial	Personnel	Systems	Legal & Administrative	Technical Services	Total
			(thousands of dollars)			
Cariboo	747	170	210	247	1,120	2,494
Kamloops	973	89	237	318	1,114	2,731
Nelson	940	116	158	355	1,410	2,979
Prince George	994	115	454	138	2,030	3,731
Prince Rupert	867	158	421	256	1,607	3,309
Vancouver	1,229	131	77	547	2,163	4,147
Victoria	4,720	1,318	2,919	1,058	24,661[1]	34,676
TOTAL	10,470	2,097	4,476	2,919	34,105	54,067

[1] Includes $21.563 million paid to the British Columbia Buildings Corporation for building occupancy charges throughout the province.

Table A-2: Ministry of Forests Personnel[1] in 1983–84, by Program

Program	April 1, 1983 FTEs Allocated	Staff	Vacancies	March 31, 1984 FTEs Allocated	Staff	Vacancies
Full Time Personnel						
Minister	5	5	—	5	5	—
Management	283	269	14	268	239	29
Finance and Administration	932	787	145	814	704	110
Harvesting	1,322	1,152	170	1,375	1,162	213
Silviculture	419	380	39	575	482	93
Research	90	82	8	99	99	—
Forest Protection	217	198	19	234	218	16
Range	88	71	17	85	70	15
Recreation	55	50	5	72	62	10
Sub-total	3,411	2,994	417	3,527[2]	3,041	486
Other Personnel	1,475[3]			618[4]		
TOTAL	4,886			4,145		

[1] Includes all personnel (permanent, auxiliary, temporary and seasonal). The concept of full time equivalent (FTE), defined as 1,827 hours (the normal working hours in one year for one full time employee), is used to account for all personnel on a similar basis.
[2] Increase due to conversion of some FTEs for auxiliary personnel to full time status.
[3] Includes auxiliary, temporary and seasonal personnel.
[4] Includes temporary and seasonal personnel.

Table A-3: Ministry of Forests Personnel[1] in 1983–84, by Forest Region

Forest Region	April 1, 1983 FTEs Allocated	Staff	Vacancies	March 31, 1984 FTEs Allocated	Staff	Vacancies
Full Time Personnel						
Cariboo	300	265	35	298	265	33
Kamloops	351	305	46	381	310	71
Nelson	354	320	34	363	325	38
Prince George	465	388	77	410	328	82
Prince Rupert	400	327	73	371	302	69
Vancouver	659	581	78	730	669	61
Victoria	882	808	74	974	842	132
Sub-total	3,411	2,994	417	3,527[2]	3,041	486
Other Personnel	1,475[3]			618[4]		
TOTAL	4,886			4,145		

[1] Includes all personnel (permanent, auxiliary, temporary and seasonal). The concept of full time equivalent (FTE), defined as 1,827 hours (the normal working hours in one year for one full time employee), is used to account for all personnel on a similar basis.
[2] Increase due to conversion of some FTEs for auxiliary personnel to full time status.
[3] Includes auxiliary, temporary and seasonal personnel.
[4] Includes temporary and seasonal personnel.

Table B-1: Harvesting Expenditure in 1983–84, by Forest Region

Forest Region	Planning, Inventory & Research	Valuation	Timber Management	Engineering & Roads	Scaling	Total
			(thousands of dollars)			
Cariboo	503	907	1,593	2,962	649	6,614
Kamloops	618	465	1,735	1,731	1,126	5,675
Nelson	1,223	561	1,929	3,113	1,120	7,946
Prince George	939	855	1,868	6,324	1,811	11,797
Prince Rupert	1,517	759	1,170	1,697	1,787	6,930
Vancouver	1,510	2,606	3,131	4,905	4,197	16,349
Victoria	6,094	1,969	1,310	2,038	—	11,411
TOTAL	12,404	8,122	12,736	22,770	10,690	66,722

Table B-2: Forest Revenue in 1983–84, by Forest Region

Forest Region	Annual Rents	Stumpage: Gross Stumpage	Stumpage: Less Credits	Stumpage: Net Stumpage	Royalty & Export	Scaling	Interest	Other[1]	Total
				(thousands of dollars)					
Cariboo	1,583	10,790	5,008	5,782	—	640	169	69	8,243
Kamloops	2,417	13,069	6,622	6,447	97	873	100	227	10,161
Nelson	1,785	8,878	5,345	3,533	247	1,010	229	40	6,844
Prince George	3,754	23,304	16,669	6,635	—	1,411	530	397	12,727
Prince Rupert	3,635	20,756	9,181	11,575	1,244	1,755	147	93	18,449
Vancouver	6,600	69,201	16,270	52,931	11,533	3,253	564	(375)[2]	74,506
Victoria	657	—	—	—	—	—	1	5,678	6,336
TOTAL	20,431	145,998	59,095	86,903	13,121	8,942	1,740	6,129	137,266

[1] Includes forest revenue from forest protection agreements, recoveries of $5.000 million from the Canada - British Columbia Subsidiary Agreement on Intensive Forest Management and other miscellaneous sources.

[2] Includes adjustment of a fire protection account for a prior period, following legal settlement.

Table B-3: Average Stumpage Prices[1] Received on Timber Billed[2] from Tree Farm Licences, Forest Licences, Timber Sale Harvesting Licences and Timber Sale Licences other than Small Business Sales in 1983–84, by Forest Region and Species

Forest Region	BALSAM		CEDAR		CYPRESS		FIR	
	Volume	Price	Volume	Price	Volume	Price	Volume	Price
	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)
Cariboo (C)	*	1.06	—	—	—	—	—	—
Cariboo (I)	292	1.18	210	1.60	—	—	972	1.35
Kamloops	702	1.18	530	1.86	*	1.28	1 317	1.37
Nelson	456	1.24	692	2.03	—	—	528	1.35
Prince George	1 389	1.16	31	1.83	—	—	253	1.70
Prince Rupert (C)	279	2.22	752	4.65	79	8.23	73	2.76
Prince Rupert (I)	1 078	1.06	90	2.75	*	1.04	*	.88
Vancouver (C)	3 063	2.92	3 389	7.58	495	10.81	1 440	3.80
Vancouver (I)	140	1.99	27	4.73	2	4.84	72	2.01
TOTAL	7 399	1.94	5 721	5.66	576	10.44	4 655	2.17

Forest Region	HEMLOCK		LARCH		LODGEPOLE PINE		SPRUCE	
	Volume	Price	Volume	Price	Volume	Price	Volume	Price
	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)
Cariboo (C)	—	—	—	—	*	.95	2	1.09
Cariboo (I)	17	1.01	—	—	2 515	1.08	1 599	1.31
Kamloops	174	.37	62	1.35	2 800	1.22	2 052	1.35
Nelson	322	.30	245	1.35	1 597	.65	1 430	1.39
Prince George	10	1.01	*	1.32	4 464	1.18	8 419	1.25
Prince Rupert (C)	1 164	2.03	—	—	*	2.02	489	5.96
Prince Rupert (I)	581	.98	—	—	2 358	1.07	2 106	1.17
Vancouver (C)	5 967	2.80	*	4.00	1	2.25	231	8.21
Vancouver (I)	84	2.00	—	—	18	1.26	82	1.64
TOTAL	8 319	2.41	307	1.35	13 753	1.09	16 410	1.52

Forest Region	WHITE PINE		OTHER SPECIES		ALL SPECIES	
	Volume	Price	Volume	Price	Volume	Price
	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)
Cariboo (C)	—	—	—	—	2	1.06
Cariboo (I)	*	5.98	*	1.16	5 606	1.21
Kamloops	37	5.58	21	1.53	7 696	1.32
Nelson	97	3.13	25	1.31	5 393	1.20
Prince George	*	1.27	1	.99	14 567	1.23
Prince Rupert (C)	*	2.49	*	2.06	2 836	3.61
Prince Rupert (I)	—	—	79	.51	6 293	1.11
Vancouver (C)	22	1.89	12	1.38	14 621	4.39
Vancouver (I)	3	2.10	1	1.02	428	2.08
TOTAL	159	3.51	139	.90	57 442	2.15

[1] Does not reflect the effect of credits against stumpage.
[2] Excludes firmwood rejects and waste.
* Indicates volume less than 500 m^3.

Table B-4: Stumpage Revenue from the Small Business Enterprise Program in 1983–84, by Forest Region

Forest Region	Volume Billed[1]	Stumpage Appraised	Bonus Bid	Stumpage Billed[2]	Stumpage Billed[2] as a % of Stumpage Appraised
	($000 m^3$)	—— (thousands of dollars) ——			(%)
Cariboo	644	687	1,275	1,962	286
Kamloops	438	627	2,256	2,883	460
Nelson	328	399	840	1,239	311
Prince George	1 087	989	2,796	3,785	383
Prince Rupert:					
Coast	241	1,104	55	1,159	105
Interior	747	943	1,593	2,536	269
Vancouver	409	1,976	1,731	3,707	188
TOTAL	3 894	6,725	10,546	17,271	257

[1] Excludes firmwood rejects and waste.
[2] Previously called "stumpage received".

Table B-5: Volume of All Products Billed[1] in 1983–84, by Forest Region and Land Status

Land Status	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Total
				(thousands of cubic metres)			
Crown Land							
Tree Farm Licences[2]	156	864	1 075	689	2 051	8 008	12 843
Forest Licences	5 413	6 629	3 750	10 580	6 779	6 072	39 223
Timber Sale Harvesting Licences	1	59	77	2 749	23	59	2 968
Timber Sale Licences	841	656	1 079	2 024	1 335	1 355	7 290
Licences to Cut	386	64	54	1 059	96	55	1 714
Timber Licences	—	126	148	—	583	5 695	6 552
Other[3]	90	146	42	28	50	383	739
Sub-total	6 887	8 544	6 225	17 129	10 917	21 627	71 329
Private Land[4]	607	555	765	514	325	3 410	6 176
Other[5]	72	32	3	26	29	41	203
TOTAL	7 566	9 131	6 993	17 669	11 271	25 078	77 708

[1] Includes firmwood rejects.
[2] Includes schedule B lands only.
[3] Includes woodlot licences, right-of-way, beachcomb, trespass and miscellaneous.
[4] All Crown granted lands.
[5] Federal lands and Indian Reserves.

Table B-6: Volume of All Products Billed[1,2] in 1983–84, by Forest Region and Species

Forest Region	Balsam	Cedar	Cypress	Fir	Hemlock	Larch	Lodgepole Pine	Spruce	White Pine	Other Species	Total
					(thousands of cubic metres)						
Cariboo (C)	—	—	—	—	—	—	*	2	—	—	2
Prince Rupert (C)	345	1 136	120	88	1 556	—	1	685	*	20	3 951
Vancouver (C)	4 918	5 389	757	3 162	9 837	*	3	300	48	193	24 607
Sub-total, Coast	5 263	6 525	877	3 250	11 393	*	4	987	48	213	28 560
Cariboo (I)	352	237	—	1 458	20	—	3 463	2 009	*	25	7 564
Kamloops	765	699	*	1 768	225	92	3 183	2 234	51	114	9 131
Nelson	555	1 059	—	813	453	332	1 833	1 724	129	95	6 993
Prince George	1 571	60	—	340	13	1	5 584	10 055	*	45	17 669
Prince Rupert (I)	1 151	126	*	*	641	—	2 809	2 436	*	157	7 320
Vancouver (I)	143	37	2	91	91	—	18	84	3	2	471
Sub-total, Interior	4 537	2 218	2	4 470	1 443	425	16 890	18 542	183	438	49 148
TOTAL	9 800	8 743	879	7 720	12 836	425	16 894	19 529	231	651	77 708

[1] Includes firmwood rejects.
[2] Includes all harvesting on Crown, private and federal lands and Indian Reserves.
* Indicates volume less than 500 m^3.

Table B-7: Area Harvested in 1983–84, by Forest Region

Forest Region	Type of Harvest	Crown Land				Private Land				Total
		TFL[1]	TSA[2]	Other[3]	Sub-total	TFL[4]	TF[5]	Other[6]	Sub-total	
		(hectares)								
Cariboo	Clear Cutting	445	19 921	4	20 370	—	—	597	597	20 967
	Selective Cutting	—	6 930	13	6 943	—	—	25	25	6 968
	Sub-total	445	26 851	17	27 313	—	—	622	622	27 935
Kamloops	Clear Cutting	2 397	18 826	653	21 876	—	—	723	723	22 599
	Selective Cutting	304	7 791	211	8 306	—	—	517	517	8 823
	Sub-total	2 701	26 617	864	30 182	—	—	1 240	1 240	31 422
Nelson	Clear Cutting	2 820	10 237	399	13 456	167	411	1 463	2 041	15 497
	Selective Cutting	903	4 838	102	5 843	—	—	1 508	1 508	7 351
	Sub-total	3 723	15 075	501	19 299	167	411	2 971	3 549	22 848
Prince George	Clear Cutting	2 128	60 262	21	62 411	—	—	2 541	2 541	64 952
	Selective Cutting	—	179	—	179	—	—	—	—	179
	Sub-total	2 128	60 441	21	62 590	—	—	2 541	2 541	65 131
Prince Rupert	Clear Cutting	3 924	19 649	157	23 730	950	—	293	1 243	24 973
	Selective Cutting	—	506	—	506	—	—	18	18	524
	Sub-total	3 924	20 155	157	24 236	950	—	311	1 261	25 497
Vancouver	Clear Cutting	10 291	12 213	1 599	24 103	4 239	3 779	2 561	10 579	34 682
	Selective Cutting	—	495	10	505	—	90	142	232	737
	Sub-total	10 291	12 708	1 609	24 608	4 239	3 869	2 703	10 811	35 419
TOTAL	Clear Cutting	22 005	141 108	2 833	165 946	5 356	4 190	8 178	17 724	183 670
	Selective Cutting	1 207	20 739	336	22 282	—	90	2 210	2 300	24 582
	Sub-total	23 212	161 847	3 169	188 228	5 356	4 280	10 388	20 024	208 252

[1] Includes Crown land within tree farm licences.
[2] Includes Crown land within timber supply areas, excluding tree farm licences.
[3] Includes Crown land within woodlot licences, farm leases, federal lands and Indian Reserves.
[4] Includes private land within tree farm licences.
[5] Includes private land within certified tree farms, but outside tree farm licences.
[6] Includes private land outside tree farm licences and certified tree farms.

Table B-8: Export of Logs from British Columbia in 1983–84, by Species

Species	Exports Under Permit[1]	Other Exports[2]	Total
	(thousands of cubic metres)		
Balsam	367	75	442
Cedar	38	4	42
Cypress	59	34	93
Douglas-fir	315	171	486
Hemlock	642	130	772
Lodgepole Pine	57	3	60
Spruce	335	21	356
Other Softwood	3	3	6
Cottonwood	156	27	183
Other Hardwood	2	10	12
TOTAL	1 974	478	2 452

[1] Export permit granted under Section 137 of the Forest Act. Logs harvested from provincial Crown land, private land within a tree farm licence area, and from private land granted by the Crown after March 12, 1906.

[2] No export permit required under the Forest Act. Logs harvested from private land that was granted by the Crown prior to March 13, 1906, and is not within a tree farm licence area, and logs harvested from federal land and Indian Reserves.

Table B-9: Small Business Enterprise Program in 1983–84, by Forest Region

Forest Region	Registrants[1]		Sales		Volume Sold[4]	Value[5]
	Cat. 1[2]	Cat. 2[3]	Cat. 1	Cat. 2		
	(number of)				($000 m^3$)	($000)
Cariboo	381	75	266	55	689	2,678
Kamloops	459	133	89	34	600	5,459
Nelson	430	201	70	47	482	1,706
Prince George	448	121	57	22	1 469	6,558
Prince Rupert	529	206	169	61	1 403	5,829
Vancouver	1,149	164	195	18	1 156	10,668
TOTAL	3,396	900	846	237	5 799	32,898

[1] On March 31, 1984.

[2] Category 1: Registrants who, at the time of application, did not own a timber processing facility.

[3] Category 2: Registrants who, at the time of application, owned a timber processing facility.

[4] Tendered volume.

[5] Value based upon appraised price at time of sale, plus bonus bid.

Table B-10: Number of Tenures as at March 31, 1984, by Forest Region

Tenure	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Total
				(number of licences)			
Tree Farm Licences[1]	1	7	5	2	6	15	33
Farm Woodlot and Woodlot Licences	13	2	4	12	5	9	45
Timber Sale Harvesting Licences	—	—	—	6	—	—	6
Forest Licences	17	27	23	26	33	47	173
Timber Sale Licences (Major)	20	45	33	37	24	49	208
Timber Sale Licences (Minor) SBEP[2]	351	288	201	116	254	531	1,741
Other[3]	387	700	250	1,661	792	11,874	15,664
Sub-Total	789	1,069	516	1,860	1,114	12,525	17,870
Special Forest Licence[4]	1	—	—	—	—	—	1
TOTAL	790	1,069	516	1,860	1,114	12,525	17,871

[1] Tree Farm Licences 2, 25 and 39 are partly in both Vancouver and Prince Rupert Forest Regions.
[2] Small Business Enterprise Program.
[3] Tenures issued within the Forest Service Reserve and tree farm licence areas, including timber sale licences (not itemized above), cash sales and free use permits. Free use permits issued between April 1, 1983, and March 31, 1984, are included. These tenures are for timber damaged by fire, insects or wind, special forest products (e.g. shake bolts) and firewood.
[4] In Lot 7741 Military Reserve.

Table B-11: Commitment as at March 31, 1984, by Forest Region

Tenure	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Total
				(thousands of cubic metres)			
Tree Farm Licences[1]	119	772	1 641	557	4 191	12 276	19 557
Farm Woodlot and Woodlot Licences	72	70	46	122	82	75	466
Timber Sale Harvesting Licences	—	—	—	3 563	—	—	3 563
Forest Licences	5 277	6 058	3 811	9 730	6 791	6 254	37 921
Timber Sale Licences (Major)	175	75	72	225	96	181	824
Timber Sale Licences (Minor) SBEP[2]	473	717	445	1 388	1 004	883	4 910
Forest Service Reserve[3]	53	80	199	145	177	120	772
Sub-total	6 169	7 772	6 214	15 729	12 341	19 789	68 014
Special Forest Licence[4]	32	—	—	—	—	—	32
TOTAL	6 201	7 772	6 214	15 729	12 341	19 789	68 046

[1] Tree Farm Licences 2, 25 and 39 are partly in both Vancouver and Prince Rupert Forest Regions.
[2] Volume apportioned to the Small Business Enterprise Program.
[3] Volume apportioned to the Forest Service Reserve. Timber from the reserve is sold under timber sale licences (not itemized above), cash sales and free use permits.
[4] In Lot 7741 Military Reserve.

Table B-12: Road Inventory, with Additions and Reductions in 1983–84, by Forest Region and Road Class

Forest Region	Road Class[1]	Initial Inventory[2]	Additions			Reductions			Final Inventory[4]
			Construction	Improvement[3]	Transfer In	Cancellation	Improvement[3]	Transfer Out	
		(kilometres)							
Cariboo	1	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—
	3	424	23	—	—	—	—	15	431
Kamloops	1	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—
Nelson	1	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—
	3	155	—	—	—	—	—	—	155
Prince George	1	88	3	—	—	—	—	—	91
	2	136	38	—	—	—	—	—	174
	3	2 035	25	8	—	—	8	—	2 060
Prince Rupert	1	66	—	—	—	—	—	—	66
	2	—	—	—	—	—	—	—	—
	3	354	5	—	2	—	—	50	311
Vancouver	1	—	—	—	4	—	—	—	4
	2	—	—	—	8	—	—	—	8
	3	7	—	—	—	—	—	—	7
TOTAL	1	154	3	—	4	—	—	—	161
	2	136	38	—	8	—	—	—	182
	3	2 975	52	8	2	—	8	65	2 964

[1] Definitions: Class 1 — Double lane, 10 m surface width, for off-highway trucks.
Class 2 — Double lane, 9 m surface width, for off-highway trucks.
Class 3 — Double lane, 8 m surface width, for highway trucks.

[2] April 1, 1983.

[3] Improvements are shown as new roads (additions) which replace old roads (reductions).

[4] March 31, 1984.

Table B-13: Bridge Inventory, with Additions and Reductions in 1983–84, by Forest Region and Bridge Class

Forest Region	Bridge Class[1]	Initial Inventory[2]	Additions		Reductions		Final Inventory[3]
			Construction	Transfer In	Deletion	Transfer Out	
		(number)					
Cariboo	P	17	—	—	—	1	16
	S	8	1	—	—	—	9
	T	79	1	—	—	3	77
	M	4	—	—	—	—	4
Kamloops	P	14	1	—	—	—	15
	S	19	—	—	—	—	19
	T	408	—	2	2	—	408
	M	—	—	—	—	—	—
Nelson	P	44	1	—	—	—	45
	S	32	1	—	—	—	33
	T	659	5	—	—	—	664
	M	20	—	—	—	—	20
Prince George	P	101	2	—	—	—	103
	S	50	2	—	—	—	52
	T	192	3	—	—	—	195
	M	112	—	—	—	—	112
Prince Rupert	P	30	—	—	—	—	30
	S	9	—	—	—	—	9
	T	121	1	—	—	—	122
	M	9	—	—	—	—	9
Vancouver	P	29	1	—	—	—	30
	S	10	5	—	—	—	15
	T	362	9	14	5	—	380
	M	3	—	—	—	—	3
TOTAL	P	235	5	—	—	1	239
	S	128	9	—	—	—	137
	T	1,821	19	16	7	3	1,846
	M	148	—	—	—	—	148

[1] Definitions: P — Permanent: Substructure and superstructure have an expected lifespan of 50 years.
S — Semi-permanent: Substructure has an expected lifespan of 50 years; superstructure of 10-15 years.
T — Temporary: Substructure and superstructure have an expected lifespan of 10-15 years.
M — Multiplate: Metal pipearches and culverts that have an expected lifespan of 50 years.

[2] April 1, 1983.

[3] March 31, 1984.

Table C-1: Silviculture Expenditure in 1983–84, by Forest Region

Forest Region	Administration	Basic	Intensive	Nursery Operations	Seed Operations	Total
			(thousands of dollars)			
Cariboo	1,443	2,859	725	—	122	5,149
Kamloops	1,784	6,850	566	—	71	9,271
Nelson	1,626	2,256	523	—	138	4,543
Prince George	2,301	12,606	1,023	—	1,203	17,133
Prince Rupert	1,723	6,808	766	—	254	9,551
Vancouver	4,200	7,273	5,148	—	95	16,716
Victoria	1,395	—	29	21,134[1]	3,070	25,628
TOTAL	14,472	38,652	8,780	21,134	4,953	87,991

[1] Includes $12.074 million for ministry nurseries, $4.892 million for commercial nurseries and $4.167 million for Section 88 credits for licensee nurseries.

Table C-2: Surveys of Natural Restocking[1] on Crown Land in 1983–84, by Forest Region

Forest Region	Area Surveyed[2]	Area Satisfactorily Stocked	Area Not Satisfactorily Stocked	Area Satisfactorily Stocked
		(hectares)		(%)
Cariboo	27 391	19 038	8 173	70
Kamloops	26 253	12 319	13 687	47
Nelson	28 761	10 687	17 427	37
Prince George	35 054	16 187	18 500	46
Prince Rupert	22 819	11 556	10 369	51
Vancouver	41 360	36 569	4 781	88
TOTAL	181 638	106 356	72 937	59

[1] Includes surveys of natural restocking on Crown land within tree farm licences.
[2] Includes 2 345 hectares of land classified as non-productive.

Table C-3: Surveys of Plantations[1] on Crown Land in 1983–84, by Forest Region

Forest Region	Area Surveyed[2]	Area Satisfactorily Stocked	Area Not Satisfactorily Stocked	Area Satisfactorily Stocked
	(hectares)			(%)
Cariboo	14 093	13 621	472	97
Kamloops	15 853	10 989	4 864	69
Nelson	6 767	5 013	1 755	74
Prince George	36 406	28 077	8 124	77
Prince Rupert	11 393	9 600	1 733	84
Vancouver	34 317	23 694	10 359	69
TOTAL	118 829	90 994	27 307	77

[1] Includes surveys of plantations on Crown land within tree farm licences. Based on surveys made 1 to 3 years after planting.
[2] Includes 528 hectares of land classified as non-productive.

Table C-4: Site Preparation for Natural Restocking on Crown Land in 1983–84, by Forest Region

Treatment	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Total
				(hectares)			
Broadcast Burned	35	—	148	—	—	611	794
Bunched (Piled) and Burned	—	142	369	767	—	—	1 278
Spot Burned	—	26	2 057	—	—	475	2 558
Drag Scarified	337	549	1 512	7 590	309	—	10 297
Blade Scarified	—	603	1 018	279	—	13	1 913
Bunched Only	14	—	309	190	—	—	513
Other Mechanical[1]	104	173	155	21	—	—	453
Chemical Only	—	—	—	—	—	116	116
Residual Falling (Including Snags)	28	71	48	—	—	556	703
Other[2]	—	31	20	26	—	—	77
Sub-total	518	1 595	5 636	8 873	309	1 771	18 702
No Further Treatment[3]	5 273	9 473	2 876	456	7 823	1 836	27 737
TOTAL	5 791	11 068	8 512	9 329	8 132	3 607	46 439

[1] Includes use of a Marden brush chopper, Leno scarifier, V-plow, disc trencher, Bracke scarifier and 6-way blade.
[2] Includes mistletoe control, cabling and knockdown of trees over 3 metres high.
[3] Land which was surveyed and found not to require treatment to promote natural restocking.

Table C-5: Site Preparation for Planting on Crown Land in 1983–84, by Forest Region

Treatment	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Total
				(hectares)			
Broadcast Burned	3 465	5 649	1 693	7 304	6 029	5 391	29 531
Bunched (Piled) and Burned	829	3 644	164	1 344	111	321	6 413
Spot Burned	—	205	52	609	—	708	1 574
Drag Scarified	—	—	192	—	422	3	617
Blade Scarified	—	74	893	3 960	296	246	5 469
Bunched Only	—	1 178	384	1 419	424	64	3 469
Other Mechanical[1]	593	829	90	2 582	2 371	37	6 502
Chemical Only	—	—	—	9	142	37	188
Residual Falling (Including Snags)	—	248	134	230	103	336	1 051
Snag Falling Only	—	48	—	—	—	29	77
Other[2]	—	—	71	607	—	38	716
Sub-total	4 887	11 875	3 673	18 064	9 898	7 210	55 607
No Further Treatment[3]	1 219	1 959	535	792	3 651	2 288	10 444
TOTAL	6 106	13 834	4 208	18 856	13 549	9 498	66 051

[1] Includes use of a Marden brush chopper, Leno scarifier, V-plow, disc trencher, Bracke scarifier, ripper plow, 6-way blade, falling and skidding.
[2] Includes mistletoe control, cabling and knockdown of trees over 3 metres high.
[3] Land which was surveyed and found not to require treatment prior to planting.

Table C-6: Crown Land Planted in 1983–84, by Forest Region

Forest Region	Area Planted			Trees Planted		
	Basic	Intensive	Total	Basic	Intensive	Total
	(hectares)			(thousands of trees)		
Cariboo	4 603	880	5 483	6,284	1,129	7,413
Kamloops	13 150	2 186	15 336	15,496	2,338	17,834
Nelson	4 541	811	5 352	5,458	967	6,425
Prince George	25 508	3 749	29 257	31,059	4,887	35,946
Prince Rupert	14 161	751	14 912	17,567	1,001	18,568
Vancouver	22 300	2 088	24 388	20,000	2,188	22,188
TOTAL	84 263	10 465	94 728	95,864	12,509	108,373

Table C-7: Brushing and Weeding on Crown Land in 1983–84, by Forest Region

Forest Region	Treatment		Total
	Manual	Chemical	
	(hectares)		
Cariboo	—	—	—
Kamloops	—	—	—
Nelson	681	2	683
Prince George	137	19	156
Prince Rupert	390	281	671
Vancouver	2 305	3 239	5 544
TOTAL	3 513	3 541	7 054

Table C-8: Crown Land Improved in 1983–84, by Forest Region

Forest Region	Spacing[1]	Fertilization	Site Rehabilitation	Conifer Release	Commercial Thinning	Other[2]
			(hectares)			
Cariboo	801	—	151	—	—	—
Kamloops	36	—	415	—	—	263
Nelson	444	—	260	6	—	5
Prince George	36	—	344	—	—	—
Prince Rupert	236	—	241	—	—	—
Vancouver	5 200	—	381	603	8	30
TOTAL	6 753	—	1 792	609	8	298

[1] Includes juvenile spacing and sanitation spacing.
[2] Includes mistletoe control, pruning and seed tree control.

Table C-9: Average Cost[1] of Silviculture Treatments on Crown Land in 1983–84, by Forest Region

Treatment	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	British Columbia
				(dollars per hectare)			
Basic Silviculture							
Surveys[2]	7	10	12	8	7	8	8
Site Preparation for Natural Restocking	120	231	101	133	132	73	125
Site Preparation for Planting	194	267	195	183	182	108	192
Planting[3]	326	255	288	269	291	269	275
Brushing and Weeding:							
Manual	—	—	341	336	529	305	338
Chemical[4]	—	—	1,393	441	445	373	379
Intensive Silviculture							
Surveys[2]	11	7	6	6	3	6	7
Backlog Planting[3]	271	214	260	249	224	240	241
Spacing[5]	191	926	189	127	488	478	426
Fertilization	—	—	—	—	—	—	—
Site Rehabilitation	269	190	254	366	395	860	409
Conifer Release	—	—	899	—	—	375	380
Commercial Thinning	—	—	—	—	—	37	37

[1] Based on on-site operating cost (equipment, transportation and wages for crew and crew boss). Does not include overhead cost (initial field inspection, planning and prescription, site delineation, general supervision of project and final inspection to check quality). Weighted by the area treated, where applicable.

[2] Includes surveys for assessing site treatment, plantation survival and stocking.

[3] Excludes cost of seedlings.

[4] Includes cost of herbicides.

[5] Includes juvenile spacing and sanitation spacing.

Table C-10: Seed Additions, Withdrawals and Inventory in 1983–84, by Species[1]

Native Species	Initial Inventory[2]	Additions: Natural Collections	Additions: Seed Orchard Collections	Withdrawals: Ministry Nurseries[3]	Withdrawals: Private & Licensee Nurseries[3]	Withdrawals: Other[4]	Final Inventory[5]
				(kilograms)			
Cedar, Western Red	439.2	94.3	0.0	14.3	6.4	1.2	511.6
Cypress	16.2	1.6	0.0	2.0	3.3	0.3	12.2
Douglas-fir	11 957.8	63.1	585.4	344.9	328.5	278.0	11 654.9
Fir, Alpine	815.2	0.0	0.0	0.0	0.0	0.2	815.0
Fir, Amabilis	4 833.0	809.8	0.0	221.9	38.6	31.6	5 350.7
Fir, Grand	837.3	80.2	0.0	11.2	6.3	0.1	899.9
Hemlock, Mountain	147.0	3.0	0.0	2.5	1.8	0.0	145.7
Hemlock, Western	870.9	11.8	0.2	11.4	22.5	0.5	848.5
Larch, Western	267.1	7.5	0.0	13.0	0.5	0.6	260.5
Pine, Lodgepole	3 894.1	190.2	0.0	181.6	61.4	2.9	3 838.4
Pine, Ponderosa	548.6	90.0	0.0	6.6	0.0	6.9	625.1
Spruce, Engelmann	4 295.2	1 396.3	0.0	91.3	59.6	20.0	5 520.6
Spruce, Sitka	769.0	27.8	2.0	14.3	1.5	0.7	782.3
Spruce, White	2 506.1	2 262.1	0.0	81.9	64.4	0.9	4 621.0
Spruce Hybrids[6]	6 755.4	1 632.3	2.4	145.9	107.2	1.3	8 135.7
Miscellaneous	146.3	3.3	0.0	4.6	2.5	6.4	136.1
TOTAL	39 098.4	6 673.3	590.0	1 147.4	704.5	351.6	44 158.2

[1] Excludes approximately 160 kilograms of seed from exotic species.
[2] April 1, 1983. Also reflects taxonomic reclassification of several spruce seedlots during 1983-84.
[3] For sowing of seedlings primarily in 1984-85.
[4] For direct seeding, export, etc.
[5] March 31, 1984.
[6] Includes natural crosses between Sitka, Engelmann, white and black spruce.

Table D-1: Forest Protection Program Expenditure in 1983–84, by Forest Region

Forest Region	Administration	Fire Management	Pest Management	Air Operations	Planning, Development & Research	Total
			(thousands of dollars)			
Cariboo	441	762	591	133	1	1,928
Kamloops	818	986	240	118	34	2,196
Nelson	727	675	513	175	71	2,161
Prince George	864	471	381	87	34	1,837
Prince Rupert	667	625	912	100	35	2,339
Vancouver	700	920	379	155	105	2,259
Victoria	326	385	332	59	444	1,546
TOTAL	4,543	4,824	3,348	827	724	14,266

Table D-2: Number and Causes of Wildfires[1] in 1983–84, by Forest Region

Cause	Cariboo		Kamloops		Nelson		Prince George		Prince Rupert		Vancouver		Total	
	1983–1984	Ten-Year Aver.[2]	1983–1984	Ten-Year Aver.	1983–1984	Ten-Year Aver.	1983–1984	Ten-Year Aver.	1983–1984	Ten-Year Aver.	1983–1984	Ten-Year Aver.	1983–1984	Ten-Year Aver.
	(number of wildfires)													
Lightning	68	102	143	268	87	278	119	201	41	65	28	97	486	1,011
Recreational[3]	24	19	47	66	34	35	21	29	23	25	34	52	183	226
Railroads	3	5	34	38	8	28	18	9	2	3	8	15	73	98
Smokers	31	26	52	97	30	48	15	22	25	19	38	70	191	282
Brush Burning[4]	10	18	14	23	11	16	27	29	34	11	19	13	115	110
Range Burning	52	18	5	7	1	1	22	13	1	1	—	1	81	41
Construction[5]	4	3	2	4	6	4	1	5	4	3	2	5	19	24
Industrial[6]	21	22	30	47	22	30	16	27	15	22	35	37	139	185
Incendiary	100	72	28	25	6	8	36	18	12	7	11	6	193	136
Misc. Known Causes	47	41	64	86	46	47	12	19	32	26	20	31	221	250
Unknown Causes	—	1	—	2	—	2	2	1	1	1	1	2	4	9
TOTAL	360	327	419	663	251	497	289	373	190	183	196	329	1,705	2,372

[1] Includes all wildfires in British Columbia.
[2] Average based on 1973 through 1982.
[3] Campers, hunters, fishermen, etc.
[4] Excludes railway and right-of-way clearing.
[5] Road, power, telephone, pipeline and right-of-way construction.
[6] Logging, milling and other industries.

Table D-3: Area Burned by Wildfires[1] in 1983–84, by Forest Region

Forest Region	Merchantable Timber		Immature Timber		Other Cover[2]		Total	
	1983–1984	Ten-Year Average[3]	1983–1984	Ten-Year Average	1983–1984	Ten-Year Average	1983–1984	Ten-Year Average
	(hectares)							
Cariboo	1 369	932	1 545	424	794	795	3 708	2 151
Kamloops	109	1 024	50	827	603	1 191	762	3 042
Nelson	31	1 018	111	532	278	1 113	420	2 663
Prince George	6 992	11 647	7 571	6 121	28 510	18 524	43 073	36 292
Prince Rupert	13 035	14 972	224	9 508	5 841	4 070	19 100	28 550
Vancouver	47	476	81	248	187	585	315	1 309
TOTAL	21 583	30 069	9 582	17 660	36 213	26 278	67 378	74 007

[1] Includes all wildfires in British Columbia.
[2] Includes wildfires on Not Satisfactorily Restocked (NSR) forest land, Non-Commercial (NC) forest land, grazing land and non-productive sites. Also includes wildfires less than 4 hectares in area.
[3] Based on 1973 through 1982.

Table D-4: Timber Burned by Wildfires[1] in 1983–84, by Forest Region

Forest Region	Merchantable Timber[2]	Immature Timber[3]	Total
	(thousands of cubic metres)		
Cariboo	207	107	314
Kamloops	39	3	42
Nelson	19	9	28
Prince George	1 308	446	1 754
Prince Rupert	3 217	12	3 229
Vancouver	9	14	24
TOTAL	4 798	593	5 390

[1] Includes all wildfires in British Columbia.
[2] Before salvage. Burned timber is salvaged wherever practical.
[3] Estimates. Based on species and generalized information on age and site. Assumes complete mortality.

Table D-5: Area Under Attack by Forest Pests[1] in 1983–84, by Forest Region

Forest Region	Bark Beetles[2]	Defoliators	Total[3]
		(hectares)	
Cariboo	406 100	18 875	424 975
Kamloops	45 300	80 400	125 700
Nelson	23 700	53 685	77 385
Prince George	35 750	10 850	46 600
Prince Rupert	29 800	152 650	182 450
Vancouver	2 100	25	2 125
TOTAL	542 750	316 485	859 235

[1] Best available estimates of losses during 1983-84. Accuracy varies, depending on the pest.
[2] Area of forests attacked by bark beetles is estimated from aerial surveys in 1983. Represents areas with trees attacked in 1982.
[3] Many more pests are endemic throughout most forests. Estimates of area under attack are meaningless for these pests without detailed measures of the intensity of infestation.

Table D-6: Timber Damaged by Forest Pests[1] in 1983–84, by Forest Region

Forest Region	Bark Beetles	Defoliators	Dwarf Mistletoes	Root Diseases	Total[2]
	(thousands of cubic metres)				
Cariboo	12 919	76	680	110	13 785
Kamloops	3 775	801	325	990	5 891
Nelson	761	20	273	585	1 639
Prince George	1 710	2	400	240	2 352
Prince Rupert	1 870	25	1 200	205	3 300
Vancouver	—	2	460	1 310	1 772
TOTAL	21 035	926	3 338	3 440	28 739

[1] Best available estimates of losses during 1983-84. Accuracy varies, depending on the pest. Only the major forest pests of British Columbia are included. Volumes are estimated before salvage. Damaged timber is salvaged wherever practical.

[2] Volume lost to decay in forests exceeding 100 years of age is not included. This is estimated at 10 million m^3 per year. Nursery and regeneration losses and growth losses due to other insects, diseases and unwanted vegetation are also not included.

Table D-7: Fire Suppression Program Expenditure in 1983–84, by Forest Region

Forest Region	Direct Fire Fighting	Suppression Flying	Equipment	Standby and Overtime	Suppression & Safety Training	Site Rehabilitation	Total
	(thousands of dollars)						
Cariboo	1,468	857	12	360	—	12	2,709
Kamloops	750	486	33	341	3	—	1,613
Nelson	164	350	—	215	1	—	730
Prince George	2,552	1,582	56	337	1	—	4,528
Prince Rupert	3,150	1,019	—	311	—	26	4,506
Vancouver	322	483	4	342	1	—	1,152
Victoria	1,279	6,919	1,376	28	23	—	9,625
TOTAL	9,685	11,696	1,481	1,934	29	38	24,863

Table E-1: Range Management Expenditure[1] in 1983–84, by Range District

Range District	Planning & Administration	Improvements: Repair & Maintenance	Improvements: Development	Inventory & Research	Total
		(thousands of dollars)			
Cariboo	668	33	306	—	1,007
Kamloops	923	—	3	—	926
Nelson	639	19	74	—	732
Prince George	559	16	—	—	575
Prince Rupert	189	—	—	—	189
Vancouver	6	—	—	—	6
Victoria	322	—	—	72	394
TOTAL	3,306	68	383	72	3,829

[1] Excludes expenditure funded by the Agriculture and Rural Development Subsidiary Agreement (ARDSA), the Employment Bridging Assistance Program (EBAP) and wholly by non-ministry sources.

Table E-2: Range Revenue in 1983–84, by Range District

Range District	Annual Rents and Fees
	(thousands of dollars)
Cariboo	457
Kamloops	413
Nelson	99
Prince George	162
Prince Rupert	40
Vancouver	2
Victoria	—
TOTAL	1,173

Table E-3: Grazing Permits and Grazing Licences in 1983–84, by Range District

Range District	Permits			Licences		
	Number	Authorized	Utilized	Number	Authorized	Utilized
		(AUMs)[1]			(AUMs)	
Cariboo	572	333,481	311,113	83	51,784	51,600
Kamloops	414	214,695	204,969	100	129,061	128,087
Nelson	245	74,494	71,041	26	9,665	9,315
Prince George	415	124,797	115,383	41	14,470	13,755
Prince Rupert	184	32,875	23,995	10	7,826	7,138
Vancouver	17	1,421	1,194	2	416	175
TOTAL	1,847	781,763	727,695	262	213,222	210,070

[1] Animal Unit Month (AUM) means the amount of forage required for one month by an average animal of the genus bos, aged 6 months or older.

Table E-4: Hay Cutting Permits and Hay Cutting Licences in 1983–84, by Range District

Range District	Permits			Licences		
	Number	Authorized	Utilized	Number	Authorized	Utilized
		(tonnes)			(tonnes)	
Cariboo	43	647	551	66	1 244	1 076
Kamloops	—	—	—	2	91	91
Nelson	—	—	—	2	35	35
Prince George	16	454	414	1	8	8
Prince Rupert	8	68	58	1	27	27
Vancouver	1	5	5	—	—	—
TOTAL	68	1 174	1 028	72	1 405	1 237

Table E-5: Range Improvements[1] on Crown Land in 1983–84, by Range District

Range District	Seeding		Fencing[3]	Weed Control[4]	Water Development[5]	Other[6]
	Grassland Rehabilitation	Disturbed Forest Land[2]				
	(ha)		(km)	(ha)	(no.)	(no.)
Cariboo	18	1 708	81	71	41	64
Kamloops	—	1 043	42	139	46	44
Nelson	72	2 552	20	48	24	30
Prince George	832	464	14	20	—	9
Prince Rupert	—	358	11	—	—	7
Vancouver	—	7	—	—	—	2
TOTAL	922	6 132	167	278	111	156

[1] Excludes improvements funded by ARDSA, EBAP and wholly by non-ministry sources.
[2] Includes seeding of clearcuts.
[3] Includes repair, maintenance and construction of fences.
[4] Control of knapweed, thistle, etc.
[5] Includes repair, maintenance and development of water sources.
[6] Includes repair, maintenance and development of trails, corrals, cattleguards, etc.

Table E-6: Average Cost[1] of Range Improvements[2] on Crown Land in 1983–84, by Range District

Range District	Seeding[3]	Fencing[4]	Weed Control[5]
	($/ha)	($/km)	($/ha)
Cariboo	45	1,491	341
Kamloops	13	2,736	372
Nelson	25	1,799	374
Prince George	125	626	141
Prince Rupert	114	2,761	—
Vancouver	200	—	—
British Columbia	51	1,804	348

[1] Based on funds from the Range Management Program, other ministry programs and private sources (on cost sharing projects).
[2] Excludes improvements funded by ARDSA, EBAP and wholly by non-ministry sources.
[3] Combines grassland rehabilitation (922 ha) and seeding of disturbed forest land (6 132 ha), mainly clearcuts.
[4] Construction of new fences.
[5] Includes containment of knapweed (247 ha), thistle (25 ha) and other species (6 ha).

Table F-1: Recreation Expenditure[1] in 1983–84, by Forest Region

Forest Region	Resource Management[2]	Site and Trail		Total
		Maintenance	Development	
	(thousands of dollars)			
Cariboo	286	165	25	476
Kamloops	332	234	5	571
Nelson	421	150	—	571
Prince George	313	79	29	421
Prince Rupert	281	81	—	362
Vancouver	445	244	23	712
Victoria	236	—	—	236
TOTAL	2,314	953	82	3,349

[1] Does not include assistance from volunteer groups and federal-provincial employment programs.
[2] Includes administration.

Table F-2: Recreation Site and Trail Use in 1983–84, by Forest Region

Forest Region	Sites		Trails	
	Maintained	User Visits[1]	Length Maintained	User Visits[2]
	(number)	(number)	(km)	(number)
Cariboo	163	210,000	230	4,500
Kamloops	272	525,000	730	89,000
Nelson	197	195,200	273	41,100
Prince George	176	200,000	317	10,000
Prince Rupert	77	82,000	34	1,200
Vancouver	131	305,700	143	36,600
TOTAL	1,016	1,517,900	1 727	182,400

[1] Estimates. Based on field surveys.
[2] Estimates.

VI. The Structure of the Ministry

The ministry established its present structure in order to decentralize administrative authority. The headquarters, region and district staffs work together to decentralize decision-making. The ministry headquarters staff define policy and provide overall guidance. They also advise the deputy minister and, through him, the minister and government on all matters relating to forest and range policy.

Headquarters Organization

As shown in the organization chart on page 52, the ministry headquarters staff is organized into the following four divisions:

— Forestry;
— Timber, Range and Recreation;
— Finance and Administration;
— Operations.

Each of the four divisions is headed by an assistant deputy minister who reports to the deputy minister. These four officials, together with the deputy minister as chairman, constitute the ministry's executive. In addition to the four assistant deputy ministers, the directors of the Information Services Branch and the Strategic Studies Branch report directly to the deputy minister.

The functions of each division are summarized below.

The *Forestry Division* ensures that all Crown forest and range lands are managed to provide the greatest long-term benefits for British Columbia. The assistant deputy minister of this division is also the chief forester. The Forestry Division maintains a comprehensive inventory of all the province's forest

and range resources and assesses these lands in terms of their present and potential uses. The division comprises the following five branches:

— Planning;
— Inventory;
— Research;
— Silviculture;
— Protection.

The *Timber, Range and Recreation Division* is responsible for formulating comprehensive timber, range and recreation programs and related resource management policies. It also advises the executive on all matters involving engineering and valuation activities. The division is composed of the following five branches:

— Range Management;
— Timber Management;
— Recreation Management;
— Valuation;
— Engineering.

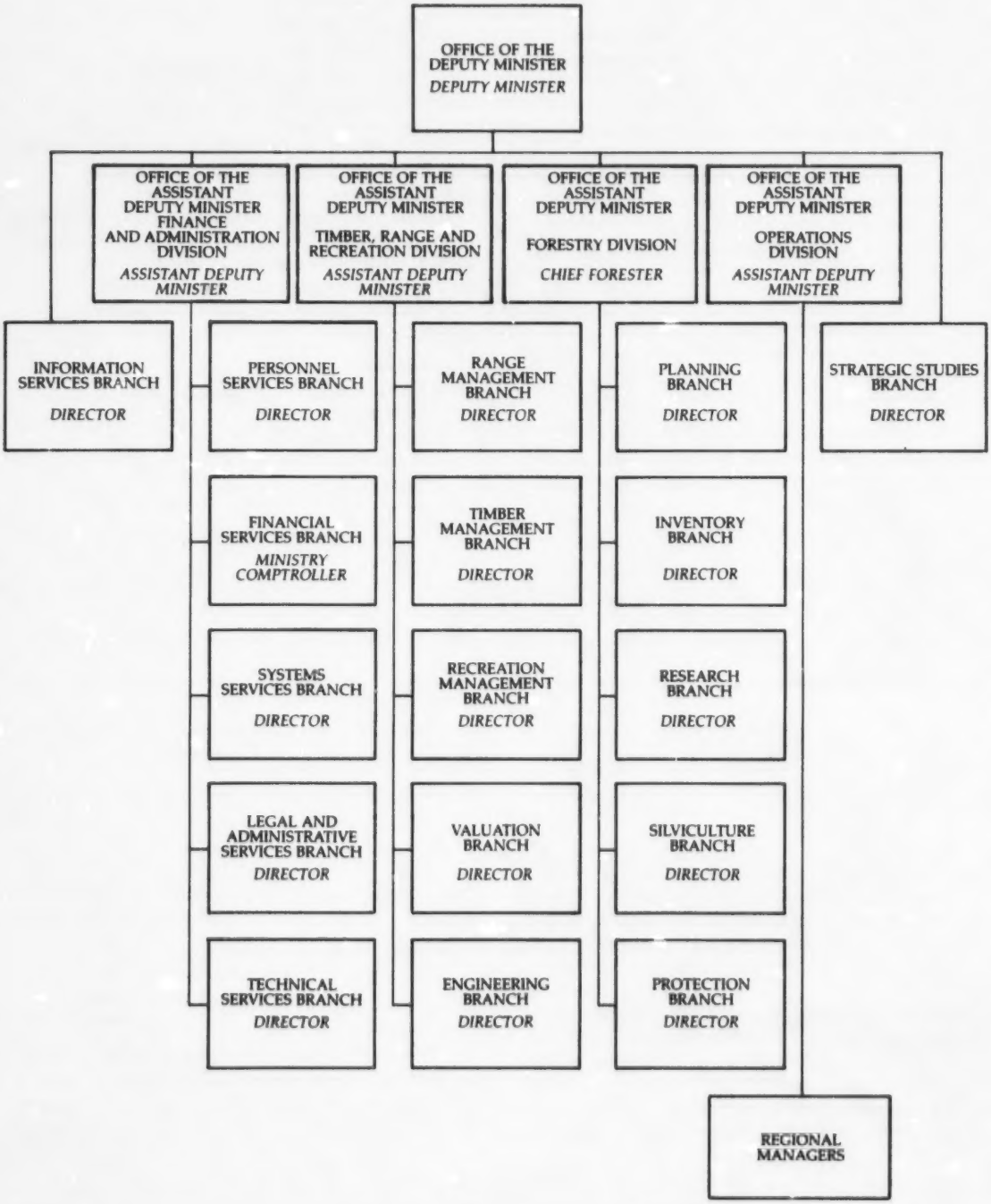
The *Finance and Administration Division* is responsible for advising the executive in all administrative matters and for developing policies and procedures pertaining to the ministry's general administration. The division is composed of the following five branches:

— Personnel Services;
— Financial Services;
— Systems Services;
— Legal and Administrative Services;
— Technical Services.

The *Operations Division* is responsible for ensuring that the ministry's policies, programs and procedures are promptly and effectively implemented in the province's six forest regions and 46 forest districts. The assistant deputy minister of operations functions as the deputy minister's immediate assistant in administering and coordinating all field operations. The six forest regions are:

— Cariboo;
— Kamloops;
— Nelson;
— Prince George;
— Prince Rupert;
— Vancouver.

Headquarters Organization



Forest Region Organization

For administrative purposes, the province is divided into six forest regions. Each is administered from its own regional office by a regional manager. Each forest region is further subdivided into forest districts which are under the direction of district managers. The internal organization of each regional office, as shown on page 54, is analogous to that of ministry headquarters. Three regional staff members provide advice and services to the regional manager and to the various district managers and field personnel. Regional office personnel are responsible for servicing, coordinating and monitoring the activities of all field personnel operating out of district offices throughout each region.

The staff of each regional office develops regional programs and plans and ensures that all policies, programs and procedures originating from ministry headquarters are administered consistently and effectively throughout the region.

Forest Region Organization